The RUBBER AGE

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Late News of the Rubber Industry

U. S. Crude Consumption Was 34,707 Tons in September

CONSUMPTION of crude rubber of all classes by manufacturers in the United States in the month of September is estimated at 34,707 long tons, according to statistics compiled by the Rubber Manufacturers' Association. This compares with an estimated consumption of 38,274 long tons for the month of August.

Total consumption of crude rubber by American manufacturers for the first nine months of this year is estimated at 382,364 long tons, this figure being obtained from the Rubber Manufacturers' Association reports for the first two quarters with the addition of the last three monthly reports. This compares with a consumption during the first three quarters of 1928 of 324,631 long tons.

On April 25 of this year, THE RUBBER AGE estimated that 1929 consumption in the United States would total 485,000 long tons. Should the monthly absorption by manufacturers for the present quarter average slightly over 34,200 long tons—approximately the same as during the month of September—the full year's consumption will reach that figure exactly.

The Association estimates total domestic stocks of crude rubber on hand and in transit overland on September 30th at 84,362 long tons compared with 90,769 long tons as of August 31st. Crude rubber afloat for United States ports on September 30th, is estimated at 49,480 long tons as against 41,619 long tons on August 31st. These estimates are based on reports to the Association which are believed to represent 95% of the total for the United States.

Firestone Financing Plan Involves $60,000,000 Issue

RETIREMENT of part of its funded debt and all of its present preferred stock, as well as allowing for capital for the expansion of production and selling facilities, is the object of new financing to the extent of $60,000,000, recently announced by the Firestone Tire & Rubber Company. This involves the largest stock issue ever brought out by a company in the rubber industry and the largest industrial stock financing move of the present year.

The financing, negotiated with a banking group comprising the National City Company, the Cleveland Trust Company and Otis & Co., will take the form of an issue of 600,000 shares of 6 per cent cumulative preferred stock of $100 par value, with common stock purchase warrants attached. In this connection, the holders of the present Firestone common stock will receive a 400 per cent stock dividend, thus splitting the shares on a five-for-one basis. The warrants attached to the preferred stock will entitle the holder to purchase one share of the new common at $55 a share.

The sale of the new preferred issue by the company to the bankers is understood to be part of a major refinancing plan which has for its purpose the retirement of the outstanding funded debt and all the existing preferred issues, in addition to the expansion of factory facilities and sales outlets.

Firestone has at present outstanding two issues of cumulative preferred, one carrying a 6 per cent cumulative dividend and the other a 7 per cent cumulative dividend. The Firestone Park Land Company, a subsidiary, has outstanding an issue of 10-year 6½ per cent bonds. The company is understood to look upon the retirement of these issues out of the proceeds of the new 6 per cent preferred issue as reducing in the long run the fixed charges ranking ahead of the common stock and at the same time greatly simplifying the company's capital structure. At present the par value of the Firestone preferred issues outstanding totals $23,025,900, while the company's total funded debt, together with the preferred stock of subsidiaries, amounts to $23,957,500.

The company, in cooperation with its extensive dealer organization, has recently been actively developin a chain of super service stations providing complete automotive facilities. It is stated that approximately 300 of these units have been established and that the program calls for the addition of from 1,000 to 1,200 more. Firestone, besides being one of the world's largest manufacturers of tires and other rubber goods, has rounded out its interests in the automotive supply business through the manufacture of tire rims, now used by leading makers of passenger cars, and, according to company statements, by 90 per cent of all bus and truck manufacturers. Batteries were also added to the line of products of the Firestone Steel Products Company this year. Through the Firestone Plantations Company, a million-acre grant in Liberia is being gradually planted to rubber.

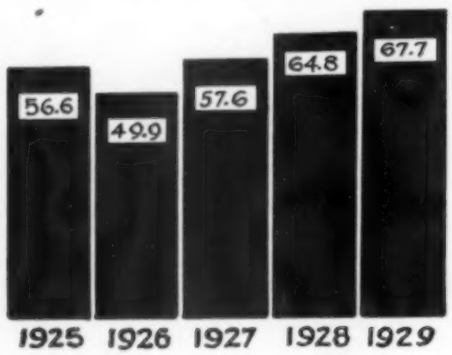
Firestone common stock has been active on the New York Curb Exchange recently, rising from its 1929 low of 202½ last month to around 275, a price that would give its new common a value of 55. The split-up will increase the outstanding common from 370,090 shares to 1,850,450 shares. There are 2,500,000 shares of common stock authorized, so that the split-up would not necessarily in-

volve an increase in authorized common capitalization. The last split-up of Firestone common stock occurred in November, 1916, when a ten-for-one division of the stock was made and the par value reduced to $10 a share from $100 a share.

Tire Dealers' Survey Shows Increase in Average Inventory

PRELIMINARY statistics covering dealers' stocks of automobile tires in the United States as of October 1 have been issued by the Rubber Division of the Department of Commerce, and disclose an increase in comparison with the average stocks on the same date in previous years. According to the returns reported from 22,347 dealers, the average stock of automobile and truck casings per dealer was 67.7 as compared with 64.8 casings in stock on October 1, 1928.

In past surveys, the average stock per dealer has been



Graphic Chart of Dealers' Tire Stocks on October 1 for the last five years

slightly higher after tabulation of final returns than in the preliminary report. For example, in October, 1928, the final average casings per dealer figure was 2.3 casings higher than the preliminary figure.

This year dealers reporting high pressure casings were tabulated separately, while dealers handling balloon casings were not thus segregated. These figures show that 17,625 dealers reported 399,920 high pressure tires in stock, or 22.7 per dealer. Balloon casings constituted 73.6 per cent of the total casings on October 1, 1929, as contrasted with 45.7 per cent a year previous and with 37.6 per cent on October 1, 1927. Inner tubes held by dealers average 101.1, as compared with the figure of 107.4 for October 1, 1928.

In the preliminary classification of dealers according to the size of stocks carried, it was found that this year a smaller percentage of reports fell into the class of dealers having less than 10 casings in stock, a greater percentage of reports falling into the classes of dealers having more than 200 casings. The body of dealers having 100 casings or less, however, remained practically the same as a year ago, constituting slightly over 86 per cent of the total number reporting.

The final report of the survey will be issued by the Department of Commerce by October 31. A comparison between the preliminary statistics for October 1, 1929, and the final statistics for October 1, 1928, is made in the following table:

	October 1, 1928			October 1, 1929		
	Number	*Dealers Reporting*	*Average per Dealer*	*Number*	*Dealers Reporting*	*Average per Dealer*
Total casings	1,685,689	26,012	64.8	1,513,054	22,347	67.7
Balloon casings	764,187	17,378	44.0	1,113,134	(1)	
High pressure casings	921,502	(1)	107.4	399,920	17,625	22.7
Inner tubes	2,750,768	25,616	107.4	2,280,080	22,048	101.1
Solids, etc.	22,793	974	23.4	21,546	884	24.4

[1]Number of dealers not tabulated separately.

General Tire Price Increase Announced by Chief Companies

PRICES of tires underwent a general upward revision this month, practically all leading manufacturers increasing their schedules to dealers. The Goodyear Tire & Rubber Company advanced prices to dealers on October 14 and was followed by the General Tire & Rubber Company, while it was understood that the United States Rubber Company and the other larger manufacturers had conferred in regard to the change and would announce similar increases.

At the time considerable difference of opinion existed as to how great the increase was to be. Prominent members of the rubber trade who received unofficial copies of the new schedule of the Goodyear company unhesitatingly declared that the increased average between 10 and 12 per cent on the prices which dealers were previously paying. As against this statement, however, B. S. Wilson, vice-president of the Goodyear Tire & Rubber Company, was quoted in dispatches from Akron, O., as follows:

"The Goodyear Tire & Rubber Company in its new price list to dealers, which constitutes the only price regulated by the company, has made an upward revision in the schedule averaging around 1 per cent, and less than 2 per cent, effective October 15."

It was generally understood, according to newspaper reports, that the new schedule arranged for a bonus plan to dealers, which would permit the smaller dealer to maintain prices at about the same level as before, but which would force the cut-rate dealers to increase their prices. This new bonus system, it was said, is arranged so that the larger buyers are put on the same basis as the smaller dealers as far as discounts go, and the dealer who sells his territory, even if it be a small one, can receive as large a bonus as the dealer covering the entire country through chain stores or buying combinations.

The establishment of the new bonus system in place of the old one of heavy discounts against quantity buying is said to explain the apparent discrepancies between the announcement by Mr. Wilson and the interpretation put upon the unofficial reports of schedules. The abolition of discounts for quantity buying, which is understood to be included in the new schedule, makes the increase to the big buying dealers average between 10 and 12 per cent and to the small buyer between 1 and 2 per cent.

The matter of the increase in prices has been under discussion by representatives of the leading rubber companies for some time. The main purpose of the discussions has been to eliminate the cut-price dealer, who has made it impossible for smaller dealers to make a reasonable profit. During the past year, the dealers have received a very slim profit, due to the prices at which they have been selling tires to meet competition from concerns which have received unusual discounts because of their large buying ability.

Dealers generally are reported to have expressed satisfaction with the reports of the new schedules, looking at the action as the one means by which tire prices, both retail and wholesale, could be stabilized. Tire company stocks on the various security exchanges responded to the increase by making marked gains.

National Tire Dealers' Session Will Consider New Merger Plan

AMONG the topics to be considered at the tenth convention of the National Tire Dealers' Association at the Hotel Sherman, Chicago, Ill., from November 11 to 14 will be the proposal for the organization of several hundred of its members into a corporation to be known as

the United Tire Stores Corporation of America. More than 2,000 dealers are expected to attend the annual convention, according to the association, and exhibit space has been reserved by more than 75 manufacturers of tires, batteries and super service station equipment.

Speakers scheduled include J. A. MacMillan, president of the Dayton Rubber Manufacturing Company; A. L. Viles, secretary of the Rubber Manufacturers Association; E. V. Hennecke, vice-president of the Cooper Corporation; A. E. Ferragen, of the Motor Wheel Corporation; Ward S. Perry, president of the Vesta Battery Corporation; and Floyd A. Allen, assistant to the president of the General Motors Corporation.

The first day of the convention will include a morning program devoted to truck tires, an afternoon program on batteries, and an Armistice night party in the evening. On Tuesday, November 12, a business session in the early morning will be followed by talks and discussions, a polo game and a theatre party. The next day will be devoted entirely to addresses and discussions, with the annual banquet in the evening, featured by the Federal Male Chorus of the Federal Rubber Company. The last day, November 14, will be given over to committee reports, general business, and the nomination and election of officers. Colonel Hubert V. Era, president of the N. T. D. A., will preside over most of the sessions.

Exhibitors at the convention comprise makers of all types of merchandise sold and equipment used by tire dealers. Among those who will exhibit are the Polson Rubber Company, the Brown Tube Company, the Mason Tire & Rubber Company, the Dill Manufacturing Company, Vogue Rubber Company, Dayton Rubber Manufacturing Company, A. Schrader's Son, Inc., Martin Rubber Company, National-Erie Company and the Williams Foundry & Machine Company.

Members of the association have been circularized by L. A. Brown, chairman of the merger committee, with regard to their willingness to enter into the new consolidation scheme, and the matter will be taken up by the board of directors of the association at Chicago.

Aetna Rubber Company is Giving Up Cleveland Plant

THE Cleveland, O., plant of the Aetna Rubber Company is being moved from that city and consolidated with the company's factory at Ashtabula, O. About half of the equipment of the Cleveland plant has already been transferred to Ashtabula, together with the general offices. The remaining half of the plant will continue in operation at Cleveland until the fall, after which it will be dismantled and the machinery taken to the new location.

A desire to co-ordinate production and at the same time to secure a more advantageous location to railroad spur trackage is understood to be the principal reason for the move, although no official statement on the subject has been made public by executives of the company.

The Aetna Rubber Company was incorporated under the laws of Ohio in 1920 and originally specialized in the manufacture of hard rubber battery boxes for automobiles and later for radio sets. Other items have been gradually added, however, and the firm now makes rubber gloves, automotive rubber parts and rubber floorings. After the annual meeting in February, S. T. Campbell, president of the company, said, "We have been establishing new lines and diversifying our business in a way that we believe will make it more stable. Our rubber flooring department will be in operation early in March, while business in the steering wheel and glove departments is heavier than ever.

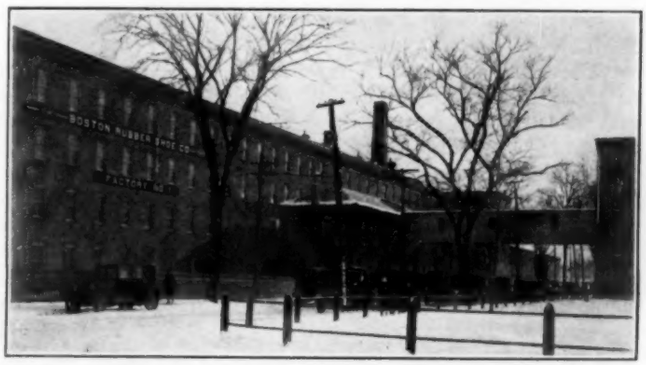
The company suffered last year from the fluctuations in price of crude rubber, its net income amounting to $108,872, equivalent to $1.15 a share on the common stock, as compared with $246,104, or $3.32 a share, in 1927. The net profit in 1925 and 1926 was $331,751 and $197,393, respectively. The balance sheet of the company as of December 31, 1928, showed total current assets of $599,117 and total current liabilities of $244,538, leaving a net working capital of $354,579.

The capital stock consists of $300,000 of 7 per cent $100 par preferred, of which $113,600 is outstanding, and 100,000 shares of no par common, of which 88,108 shares are outstanding. The company has no funded debt. The company offered pro rata to stockholders of record June 15, 1928, 30,000 shares of the common stock at $17.50 a share. Dividends have been paid regularly on the preferred, but payments on the common have been irregular, amounting to $2 a share in 1928 and being reduced to $1 for the present year. The preferred and common stocks are listed on the Cleveland Stock Exchange.

United States Rubber Company Discontinues Malden Shoe Unit

THE United States Rubber Company has discontinued manufacturing operations at the Boston Rubber Shoe Company plant at Malden Mass., which employed more than 1,000 operatives. The company had previously shut down Plant No. 2 of the Boston Rubber Shoe Company at Melrose, Mass., last February at the same time that manufacturing was discontinued at the factory of L. Candee & Company, New Haven, Conn.

Since the United States Rubber Co. was organized in 1892 it has conducted rubber footwear manufacturing operations in a large number of factories scattered throughout New England. Except during the war period and a few unusual seasons there has always been a larger number



Malden Factory of the Boston Rubber Shoe Company

of factories than the company actually needed for this purpose, and there have been periods practically every year when the plants were able to operate only on a reduced schedule, whereas fuller operations the year round would have been possible had the number of plants been smaller.

The constant pressure for greater efficiency makes it necessary for the company to concentrate its footwear manufacturing operations into fewer plants. The Boston Rubber Shoe factory is one of the oldest rubber footwear factories in the country, dating back to 1853. To bring it to a high state of manufacturing efficiency would require heavier expenditures than would be justified. "New England will suffer in no way from the change, for the operations will merely be transferred to other New England factories," says the company's official statement made Oct. 12 when the move was announced.

Samson Tire Earnings Figured At $600,000 for Current Year

PRESENT sales volume and prospective business for the remainder of 1929 indicate a favorable earnings trend for the Samson Tire & Rubber Company, according to officials of the organization. Volume of sales for the first seven months of this year was 14 per cent ahead of the like period in 1928 despite lower unit prices, and, while final earnings figures have not yet been compiled, A. Schleicher, president of the company, has stated that these will be in excess of a year ago.

For the seven months' period ended July 31, Samson reported sales of $5,257,792, compared with $4,592,963 for the similar period in 1928. Number of tires sold increased 32 per cent, while the number of tubes was 22 per cent over the corresponding period of last year.

Although Samson has not yet published an earnings statement this year, indications at the semi-annual period were that the company's net profits were running at an annual rate of approximately $3.50 a share on the 165,000 common shares outstanding. With that trend continued, it would not be surprising if Samson for the full year should show in the neighborhood of $600,000 profit, or $3.25 a share after interest on outstanding bonds. Samson so far this year has weathered the crude rubber price fluctuation nicely, it is reported, and the company's contracts ahead indicate careful hand-to-mouth buying.

The new plant of the Samson Tire & Rubber Company is almost completely in operation, its old San Diego fatcory having been dismantled while the Compton plant is gradually being closed down. At present a small quantity of tubes is being manufactured at the latter plant, but shortly will be transferred to the new Los Angeles factory. The new plant is turning out 4,000 tires and 6,000 tubes daily within the near future. Benefits from economy of operation resulting from modernized machinery together with savings in freight costs due to a more centralized location are expected to be reflected only in small measure this year.

The Samson company now makes sales through a list of more than 1,200 dealers throughout the United States and has firm contracts with several of the largest national consumers, including Montgomery Ward & Company and Sears, Roebuck & Company. Distribution for the entire 1929 output was assured some time ago, the company has stated, and was limited only by plant capacity.

The balance sheet of the Samson Tire & Rubber Company as of November 30, 1928, showed current assets over eight times current liabilities and net working capital of $1,599,229. Recently, the company's common shares have sold on the Los Angeles Curb Exchange for as low as $12, which is approximately four times average earnings of $3 a share on the average number of shares outstanding over the past five years.

Seiberling to Market Batteries; Plans to Make Tires in Germany

EXPANSION in two directions has been announced by the Seiberling Rubber Company this month. The company, through a contract with the Cooper Corporation, Findlay, O., will distribute through its dealer organization three lines of storage batteries under the Seiberling brand. Its second line of expansion has been the conclusion of arrangements with the Fulda Rubber Company, of Fulda, Germany, whereby the latter firm will make and distribute Seiberling tires in Germany through what F. A. Seiberling, president of the Akron company, described as a "merger agreement."

The contract by which the Cooper Corporation will produce several thousand automotive storage batteries annually was closed during the last days of September. The battery, which will be known as the Seiberling "Camel," is of the non-liquid type and requires re-watering only once in 90 days. Its plates are protected by semi-solid electrolyte against shredding and are practically invulnerable to burning. No acid spray can form to corrode terminals, ruin upholstery or clothing.

The Seiberling Rubber Company has been testing various makes of storage batteries for over twelve months, subjecting them to road and laboratory tests at both high and low temperatures. It is claimed that the Cooper Dri-Power type which was finally adopted was run for 20,000 miles without re-watering. Seiberling dealers, it is said, have requested the company for five years to enter the battery business.

The arrangements with the Fula Rubber Company, one of the five largest rubber manufacturing concerns in Europe, were made by Mr. Seiberling himself while in Europe on his mission to stabilize the price of crude rubber. "I have arranged," Mr. Seiberling stated, "to furnish designs, specifications and executive direction for the Fulda Rubber Company. Seiberling pneumatic tires will be made and distributed in Europe by the Fulda company, which has heretofore devoted itself to the building of solid tires. The Fulda company has a plant capacity of from 1,000 to 1,500 tires daily.

"The arrangements whereby it will manufacture Seiberling tires are now effective, and production will begin as soon as tire molds from this country can be prepared and shipped to Germany. This agreement will provide that all manufacturing of the new Seiberling-Fulda tire will be under direct guidance of executives chosen and trained by us."

Mr. Seiberling revealed that the present manager of the Fulda company is a former Akronite, M. Searight, who served as a chemist in the Seiberling organization. He declared that another executive would probably be sent to Fulda from his organization to take charge of production when the pneumatic tire is turned out there.

August Tire Production Is Lowest for the Year

TIRE manufacturers in the United States produced a total of 5,805,804 pneumatic casings during the month of August, according to estimates issued by the Rubber Manufacturers Association. Total production of inner tubes is estimated at 5,846,402 and total production of solid and cushion tires at 42,818 for the month. This output by domestic factories is the lowest thus far reported during 1929.

Total shipments during August are estimated as follows:

Pneumatic Casings, all classes	7,844,748
Inner Tubes	8,183,262
Solid and Cushion Tires	56,870

Inventories as of August 31, 1929, are estimated as 14,225,820 for all pneumatic casings; 14,156,770 for inner tubes, and 156,410 for solid and cushion tires.

The tire industry is estimated to have consumed a total of 60,644,800 pounds of crude rubber and 21,070,370 pounds of cotton fabric during the month of August in the manufacture of all types of pneumatic casings, inner tubes and solid and cushion tires.

The association's estimates are based on reports furnished by manufacturers who produce approximately 75 per cent of the total for the United States.

The Rubber Exchange *of* New York Ends Its Fourth Year

Has Operated During the Year in a Free Market for the First Time Since Its Inauguration—Futures to the Value of $217,000,000 Dealt In—Francis R. Henderson Again Elected President

AT THE annual meeting of the Rubber Exchange of New York, Inc., held October 8, the fourth yearly report read by F. R. Henderson, president of the Exchange, disclosed that contracts in rubber futures to the extent of 470,330 tons, valued at approximately $217,000,000 were traded in through the Exchange during the fiscal year ended August 31 last. This was only a few tons short of the record established last year. It is significant that the volume of trading compares with the estimated consumption of from 480,000 to 500,000 tons for the United States for the year 1929. President F. R. Henderson said the year had been a notable one because of the part rubber had played in the unprecedented prosperity of the country.

"The substantial increase in rubber consumption has largely offset the increased production, and this has been reflected in the comparatively narrow price range during the year," Mr. Henderson said. "I believe the Rubber Exchange has definitely proved its value to the industry as a whole. It is the first year since our organization that we have had a free market with which to deal. In other words, economics have been permitted to prevail, and what might be termed a true value of the commodity has resulted. In the early spring speculative purchasing reached a high point of enthusiasm, and met with the usual check which Exchange operations afford."

Deliveries of physical rubber on exchange contracts showed an increase of 24 per cent over the previous year amounting to 19,842½ tons. During the year there were 62 quality arbitrations, eight quality appeals and two technical appeals.

The most active day was January 11, 1929, when 3,887 lots or 9,717½ tons changed hands. This exceeded the previous record of 3,594 lots on April 4, 1928. The range of price fluctuations was 10.9 cents per pound, from a high of 28.20 cents on February 25, 1929, to a low of 17.30 cents on December 3, 1928. This figure compares with a fluctuation of 26.9 cents per pound during the previous year.

The report showed that England continues to lead in foreign membership representation on the exchange, having 28 members, against 10 for France, five for Holland, one for Germany and one for India. Annual dues for members of the exchange were fixed at $300 for the ensuing year.

In the course of his report, Mr. Henderson commented on the comparatively quiet trading of the last two or three months and ascribed the situation to the following causes:

"First—the unprecedented interest on the part of the public generally in stock market operations. Earnings of major companies in our key industries have revealed the situation, in which the general public seems more and more anxious to share, not as bondholders, but as partners in announced development programs. A side-light of considerable interest is a development of the investment trust type of organization, which will go far to give permanency to public participation in business generally.

"Second—conditions outlined above naturally mean a temporary lack of interest in commodity markets generally.

"Third — considerable uncertainty has prevailed in the past sixty days on account of the tire inventory figures. An increase in replacement business, plus an adjustment of tire production has considerably altered this picture. I venture the belief that, statistically, our industry is in the most satisfactory condition of recent years. I anticipate more regular activity when the true position of rubber is more generally apparent.

"Since my last report, the board of governors has given

The Rubber Exchange During an Active Trading Session

constant thought, and there have been many discussions in relation to the new contract. We recognize that some changes are highly desirable. The board, however, has felt that with the first year of unrestricted market conditions we should permit the time element to guide us to insure the thorough coverage of the various points at issue. Your board feels now that we can confidently reach a solution that will give us a more flexible contract to better demonstrate the value of Exchange operations."

At the meeting of the Exchange on October 15, held for the purpose of electing officers for the ensuing year, Mr. Henderson was re-elected president for the fourth successive time. The balloting was held on the floor of the Exchange. Other officers elected were as follows:—vice-president, Charles T. Wilson; treasurer, J. Chester Cuppia; members of the board of governors, Harold L. Bache, William E. Bruyn, James T. Bryan, Herbert S. De Lanie, J. Frank Dunbar, Jr., John L. Handy, John L. Julian, David S. Kubie, Jerome Lewine, Fred Pusinelli, William H. Stiles, and Edward J. Wade.

September Rim Output Shows Gain

PRODUCTION of automobile and other rims during the month of September rose sharply above the output for the previous two months, although not quite reaching the figure for September, 1928. During the past month the number of rims inspected and approved by the Tire & Rim Association, Inc., totaled 2,110,003 as compared with 1,570,099 in August and with 2,315,604 in September of last year. The total for the first nine months of 1929 stands at 21,017,904 as against 19,818,233 for the same period a year ago. Balloon sizes represented 80.7 per cent of the total September rim production.

Baling Inner Tube Scrap Rubber

Akron Group, Rubber Division, Holds Meeting

CLOSE on to 350 technical men attended the meeting of the Akron Group, Rubber Division, A. C. S., at the Knights of Columbus Hall on Monday evening, October 14. The subject selected for the evening was "Tire Construction and Design," various phases of which were covered by three interesting papers.

The first paper was on "Rims," by Clarence Morr, substituting for J. C. Swain, of the Firestone Steel Products Company, who was ill. Mr. Morr described all existing types of rims, clamps and fittings and covered briefly the sales problems as they affect rim dealers. "Though standardization has been effected in rim contours and sizes, no similar standardization has been brought about below the rim, that is on clamps, fittings, etc.," said Mr. Morr. Each manufacturer has developed his individual method of holding rims to the wheel felloe and holding the tire on the rim.

The second talk was on "Tire Construction," by V. L. Smithers, president of V. L. Smithers, Inc. Mr. Smithers reviewed the development of tire manufacture with reference to bead construction, as well as the causes of rim cutting. He divided tires into three groups; the high, round and squatty types, and gave the advantages and disadvantages of each. The cord angles used by leading manufacturers varied from about 35 to 45 degrees, with an average of 39, the speaker being unable to account for such a wide variance. Tread contours were also discussed. Though originally were of the crescent type they have changed to the flat type with a recent tendency toward a slightly rounded form.

The other speaker of the evening was J. C. Sproul, of B. F. Goodrich Company, who covered the "Indoor and Outdoor Testing of Tires." Mr. Sproul described the internal and external types of machines used for indoor testing, stating that the external type drum machine was used most extensively. The dynanometer was developed in 1918 for testing power consumption. Such indoor testing is economical, quick, conditions are controllable and frequent inspection is possible. However, indoor testing is not as good as outdoor testing on cars, and such tests are essential even though they are an expensive form of quality insurance. Outdoor tests prove more convincing, they show the effect of air, sun and water and the tires are more subject to all the usual forces of wear. The limitations of outdoor testing were described to the variation in motors which may cause differing results, weather conditions which cannot be controlled. Definite results from a series of tests over a period of time under as nearly similar conditions as possible have been few and expensive.

Before the presentation of the papers and following the dinner, a short business meeting was held at which it was decided to hold one more meeting this year, sometime during December, at which the election of officers for the next calendar year would take place.

Following the business meeting, Dr. E. A. Hauser, of Germany, was introduced by R. P. Dinsmore. Dr. Hauser has been in this country since September 1 but plans on leaving on the *Bremen* on October 25. It is understood that he has been doing consulting work for a Boston chemical manufacturer. Dr. Hauser is well known for his work on latex, the X-ray structure of rubber and the invention of Revertex. He spoke briefly on his work with latex and predicted a wider application of this form of rubber within the next few years. He also extended an invitation to American rubber chemists to attend the meeting of the German Society of Rubber Chemists, at Frankfurt-am-Main on June 8, 9 and 10, 1930, and assured those who could make the trip, a most enjoyable and profitable time.

The meeting was conducted by K. D. Smith, vice-chairman of the group. Other officers include George K. Hinshaw, chairman and C. W. Sanderson, secretary-treasurer. R. R. Jones, of the Firestone Tire and Rubber Company, was in charge of the program and C. R. Park, Goodyear Tire and Rubber Company, was in charge of publicity.

Toxic Substances *in the* Rubber Industry

PART IV

By P. A. DAVIS, A.B., M.A., M.D.
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CARBON BI-SULPHIDE CS_2

CARBON bi-sulphide or disulphide is a direct combination product of heated carbon and sulphur.

$$C + S = CS_2$$

S

The chemically pure product is a colorless mobile liquid with only a slight sweet odor. It is heavier than water, boils at 46.5°C, inflames at 149.5°C producing CO_2, SO_2 and traces of COS. It is almost insoluble in water but mixes very readily with alcohol and ether. Its vapor is heavier than air with a density of 2.6. The commercial product has a very disagreeable odor which is due to impurities of the sulphur group. The commercial product is purified in several different ways, chiefly by treating with lead acetate and lime water and redistilling, or distilling over mercury or mercuric chloride.

Carbon bisulphide is a good solvent for phosphorus, sulphur resins, waxes, fats, iodine, rubber and is used extensively in the vulcanization of rubber in the cold process. It is also used in making cellulose especially in the manufacture of artificial silk.

It is a good solvent for rubber and is used extensively in rubber cements. It is most always used in combination with benzol. However, due to its poisonous properties it is being gradually displaced by other solvents. It is still used considerably as a carrier for sulphur in the cold process of vulcanization.

Small amounts of CS_2 can be detected readily by the following methods:

1. Use an alcoholic potassium hydroxide solution for absorption, then add a soluble copper salt and a yellow copper compound is formed which precipitates out.
2. Subject CS_2 to trephenylphosphine and a bright red compound precipitates out $(P(C_2H_5)3_3CS_2$.

Its presence is very readily detected because the commercial product, even in very small quantities, has a very foul disagreeable odor.

The chief avenues of entrance into the system is by the respiratory and elementary systems. Skin absorption is very slight as the reaction of the skin to CS_2 immediately produces a protective as well as a non-absorbing barrier. Of the two avenues of absorption that of the respiratory system is the chief one. The inhalation of small quantities of CS_2 over a period of two or three hours produces very marked symptoms in certain individuals. One or two milligrams to a liter over a period of an hour produces severe headches and often mental confusion.

Poisoning by CS_2 differs from most other volatile solvents in that the period of recovery is longer and this is due to the formation of sulpho-proteins of the nerve and muscle tissue.

Symptoms

1. Slight irritation of eyes, nose and throat at the beginning. Desire to cough.
2. Headache—one of those throbbing kind which makes the head feel like it would burst.
3. Nausea—The first nausea is probably produced from the reflex from the nasal mucosa and later due to systemic absorption.
4. Dizziness with parathesias.
5. Disturbed equilibrium with intermittent contractions of muscles due to nerve trunk irritation.
6. Mental confusion and physical inertia. Muscle-nerve pains.
7. Disturbances of circulation, such as decreased hemoglobin, formation of many transitional cells, a general hemolysis, increase in blood platlets and blood dust, producing a picture of a toxic anemia. In severe cases the coagulation time is lengthened and sub-cutaneous hemorrhages result. The white cells are not affected only in severe cases then the pigment of the nucleo-plasm is increased and by staining with a weak sodium arsenite solution this pigmentation is shown to have increased, in all probability due to sulphur compounds.
8. Urinary Symptoms—Increased specific gravity occasionally above 1040. Hematin present and in severe or chronic cases, albumen, casts, indoxyl-sulphuric acid bile pigments and sulpho-mucins.
9. In-coordination—impulsive acts.
10. Hallucinations—especially of sight, taste, smell and hearing.
11. Depression and hysteria. This is more common in female workers than male.
12. Anaesthesia of parts of body.
13. Acute mania with convulsions.
14. Coma and death.

Hearing is affected very early and one may suspect deafness at first but after a history of exposure this is very readily explained. In light skin individuals a toxic dermatities often develops, followed by an increase in pigment. The neuro-muscular sexual system is affected, often producing in a pregnant woman a miscarriage and hemorrhage, and in others a perverted sexual cycle.

Carbon bi-sulphide has a selective action on the neuro-muscular system and most any symptom which you might expect to develop from such an involvement is usually present at some period during the poisoning as it passes from a slight absorption through to the chronic stage. There is no one characteristic and specific symptom by which you can label a case of carbon-bisulphide poisoning unless you have a history of definite exposure. In all cases where there are marked neuritic symptoms, impulsive talking, anaesthesias and paraesthesias one must suspect exposures to CS_2, and a very thorough investigation should be made as to exposure.

Cooperation Between Departments

It has been my experience that a very close co-operation between the Medical and Chemical Departments of an industry has resulted in the prevention of many cases of industrial poisoning. All new compounds and new processes involving the use of chemicals should be submitted to the Medical Department for investigation as to the toxicological effects on the human mechanism.

I believe the slow recovery from the toxic effects of CS_2 is due to the formation of many a sulpho-proteins in the neuro-muscular

system and to the increased toxic effects of sulpho-proteins over that of other proteins.

Preventive Measures

1. Substitution of some other solvent and curing agent. This is gradually being accomplished. The "cold or acid cure" at the present time is not extensive, especially in tires but is still used in some sundries manufacture. Carbon tetra chloride which is less toxic has replaced CS_2 in many processes, and where a sulphur carrying compound is needed sulphur chloride is used.
2. Proper Ventilation. CS_2 is heavier than air and its fumes gravitate to lower levels and pockets. Suction ventilation from the lowest levels with intake ventilators at a higher level. Systems using CS_2 should be closed and as near air-tight as possible. Open processes should be carried out under an exhaust hood.
3. Body Protection. If the hands are to be placed in solutions, rubber gloves should be worn. Rubber boots and aprons should be worn by workers mixing cements and compounds which contain CS_2. The hands should be kept out of solutions of CS_2.
4. Examination and Rotation. Only healthy individuals should be permitted to work with CS_2 and preferable male. Periods of rotation should be instituted and only short periods of exposure permitted. Dark skinned individuals are less affected than light-thin skinned individuals.

Individuals who have at present or have a history of having had any of the following should not be permitted to work in CS_2:

1. Nephritis
2. Diabetis
3. Neuritis—chorea
4. Epilepsy or cerebrial convulsions
5. Nerve palsies
6. Optic neuritis
7. Chlor-anemia
8. Lead poisoning
9. Tabes-paresis
10. And in female workers, menorrhagia, inter-menstural disturbances and dispositions to miscarriage. Pregnant women, if it is known, should absolutely not be permitted to work in CS_2 vapor.
11. Mentally deficient individuals, whether temporary, or ones with a previous history of any mental irregularities.

Any individual who has a history of working in CS_2 and has the slightest symptom develop should at once be removed from the operation and not replaced for several weeks. The medical supervisor should visit all these processes at frequent intervals and acquaint himself with the conditions that exist and make such recommendation that is for the good of the individual as well as the industry.

Prognosis and Treatment

The prognosis depends on two factors:

1. Is the individual a healthy individual and has he been free from any previous pathological conditions which might delay his recovery.
2. What has been the length of exposure and what has been the concentration of the vapor to which he was exposed.

Slight exposures of healthy individuals are not detrimental and the prognosis is good. Prolonged exposures of the same individual to the point of development of a cachexia is serious and the prognosis is not good.

The cases which develop suddenly are not so serious as those which are slow in developing for the removal of the former usually recover more readily due to the low percentage formation of sulpho-proteins. In the chronic cases there are destructive or degenerative changes in the liver cells, spleen, kidneys, glands of internal secretion and nerve tissue. The prognosis in these cases depends entirely on the amount of tissue involvement and the ability of the body to regenerate the tissues or for other normal tissue to assume the work. Time alone is the determining factor as to the permanent disability.

My opinion on all industrial poisons is one of prevention. It is more efficient to safeguard your employees against toxic substances, than to treat them after they are affected, for in many cases the treatment is not successful after serious degenerative changes have taken place. There is no specific treatment for CS_2 poisoning.

Acute Cases

In acute poisoning the following procedures should be carried out:

1. Remove to fresh air.
2. Remove clothing, as often much CS_2 is absorbed by the clothes.
3. If in stupor or a faint, hot applications or a hot bath.
4. If in stage of excitement cold applications. Ice cap to head.
5. S S Enema with $MGSO_4$.
6. Catheterize.
7. Gastric lavage.
8. Produce free Catharsis and diuresis preferably by castor oil, sodium citrate and Fischer's Solution intravenously.
9. Use opiates sparingly in periods of excitement.
10. Caffeine for the heart.
11. Alpha-Lobelin for respiratory stimulation.

In Chronic Cases:

1. Removal from contact with CS_2 or any toxic vapors especially H_2S.
2. Rest in bed.
3. Protect heart with Caffeine, Strychmme or digitalis.
4. Hexaresorcinol for kidney irritation.
5. Supply generous portions of nitrogenous foods and simple proteins.
6. Soluble forms of Calcium as the Calcium Metabolesum is affected.
7. Treat muscle atrophy by massage, electricity and ultra violet radiation.
8. General tonics containing iron, lime, magnesium and phosphorus.
9. Elimination of all possible foci of infection.

Other symptoms may be treated as they develop. The prime important thing to remember is that elimination is the essential procedure.

Conclusions

1. All workers in CS_2 must be observed very closely and removed from contact with the vapors at once if any neuro-muscular symptoms are present.
2. That preventive measures are the curative measures.
3. That CS_2 has a predilection for the neuro-muscular system.
4. Recovery from CS_2 is much slower than from most other volatile substances used in the rubber industry with the exception of Isoprene.
5. Proper ventilation, closed systems and substitution products will in most cases prevent the hazard of CS_2 from developing.

New Reclaiming Process

A DEMONSTRATION was recently given in Sydney, Australia, of a new rubber reclaiming process, invented by O. C. Hosking, technical rubber adviser of the Metropolitan Omnibus & Transport Co., Ltd. The demonstration, which was witnessed by C. O. Sherwood, general manager in New South Wales of the Dunlop-Perdriau Rubber Co., Ltd., G. Chatfield and C. Sellards, general manager and technical expert, respectively, of the Goodyear Tire & Rubber Co. of Australasia, and others, was really a continuation of a former demonstration, and included the manufacture of small articles from the newly processed reclaimed rubber.

Mr. Hosking's process is, at present, held secret, but it is declared that it can accelerate the rate of rejuvenation, raise or lower density, and expedite vulcanization. The process is described as entirely alkaline, and is claimed to be cheaper than other processes. In the demonstration, Mr. Hosking used some hurriedly prepared stock, consisting of worn-out tires which had been ground up and treated, but had not been properly cleansed of impurities and dried. Nevertheless, the articles manufactured in a miniature plant showed surprising freshness, resilience, and elasticity.

*Predicting Life of Rubber Products in Abrasive Service**

A NUMBER of interesting investigations have been under way in Committee D-11 on Rubber Products of the American Society for Testing Materials to develop a test method that will enable laboratories to predict the life of rubber products in abrasive service. At the same time abrasive wear in service has been studied, the committee limiting this part of the investigation for the time being to the abrasive action on pneumatic tire treads. These investigations have been carried out under the immediate jurisdiction of a sub-committee under the chairmanship of Harlan A. Depew, research chemist of the New Jersey Zinc Company.

Table 1 lists the compounds chosen, and Table 2 gives the service results obtained by five laboratories.

Table 1

Test Compounds

	No. 5	No. 6	No. 8	No. 9	No. 10
Pale Crepe	50	50	40	30	50
Smoked Sheet	50	50	40	30	50
D. O. T. G.	1.25	1.25	1.12	1.0	0.45
Sulfur	3.5	3.5	3.5	3.5	3.5
XX Red Zinc Oxide	18.2	18.2	18.2	18.2	18.2
Micronex	24.4	40	37.5	35	40
Stearic Acid Double Pressed	2	2	2	2	2
Medium Pine Tar	2	2	2	2	2
Whole Tire Reclaim	—	—	33	66	—

(Philadelphia Rubber Works Company, No. 200.)
Laboratory Cure—60 Min. at 40 lbs.
Tire Cure—15 Min. rise, 75.
Min. at 40 lbs.
5.—Low Abrasion Standard.
6.—High Abrasion Standard.
8.—Second Grade Tread.
9.—Third Grade Tread.
10.—Undercured Tread.

All of the compounds except 10 were cured more tightly than the general practice, and this may have caused some of the relative results to be different than would have been expected.

Table 2

Abrasion Resistance as Determined by Tire Tests

	Compound Number				
Laboratory	No. 5	No. 6	No. 8	No. 9	No. 10
1	100	103	56	52	124
2	100	89	76	41	103
3	100	85	71	52	88
4	100	98	80	71	99
5	100	102	79	60	98
Average	100	95	72	55	102
2 Winter Test	100	99	72	62	167

The abrasion resistance of Compound 5 was arbitrarily set at 100. The service tests were made by the Dunlop Rubber Company (England), the Fisk Rubber Company, the Goodyear Tire and Rubber Company, the Miller Rubber Company, and the New Jersey Zinc Company.

These results show that the checks on tire tests are no better than the checks previously reported on laboratory tests[1]; for example, one laboratory obtained 56 for Compound 8 and another obtained 80. Similarly two so-called checks on Compound 10 were 88 and 124. It was especially interesting that the undercured Compound (10) gave as good abrasion resistance as the more tightly cured compounds. In fact during the winter, when cold stiffened the undercured compound, it gave better results than the other compounds. The variation in results was probably due to differences in the preparation of the compounds.

There apparently is considerable variation in the abrasion resistance of different batches of the same compound. In order to eliminate this difficulty, a piece of the tread was press cured at the same time that the tire was being cured and the abrasion resistance was determined by the laboratory.

Table 3 shows fair agreement between these laboratory tests with the corresponding service tests.

Table 3

Direct Comparison of Laboratory Tests with Service Tests

	Compound Number				
	No. 5	No. 6	No. 8	No. 9	No. 10
Dunlop Machine Tests	100	76	68	62	100
Corresponding Service Test	100	85	71	52	88
N. J. Z. Co. Machine (6 lifts)	100	117	87	67	86
Corresponding Service Test	100	102	79	60	98

A comparison of service tests with machine tests that gave unusually close agreement is arranged in Table 4.

Table 4

Comparison of Laboratory with Service Tests

Stock	*Estimated Road Service*	*Grasselli Machine*	*(6 lifts) N. J. Z. Machine*	*U. S. Machine*
First Quality	100	100	100	100
First Quality	91	90	98	88
25% Reclaim	59	54	61	67
40% Reclaim	41	46	47	60

(Not the stocks listed in Table 1)

The committee is indebted to E. W. Fuller of the Fisk Rubber Company for the data in Table 4, which was obtained on a different series of stocks from those listed in Table 1. The laboratory tests were made by the du Pont Company, the Fisk Rubber Company, and the New Jersey Zinc Company.

The column headed estimated road service represents the average values of considerable experience with the four stocks. For the correlation between machine tests and service tests to have been so satisfactory, it is evident that the stock used for the laboratory tests must have been representative of the average used for the road tests. The laboratory agreement was also quite satisfactory between the three machines investigated.

All of the abrasion tests that have been investigated have been relative tests and have reported the test sample in terms of a standard. It would be desirable to eliminate the standard, and the committee will welcome suggestions as to how it may be eliminated. In accumulating information with this thought in mind, the committee plan for the next step to make a series of hardness and tear tests, using the recognized methods.

*NOTE: *Report of Committee D-11, American Society for Testing Materials.*
[1]*India Rubber World*, Vol. 74, p. 266, August 1, 1926.

Schaphorst's CHATS *with the* ENGINEER

By W. F. SCHAPHORST, M.E.

Modernizing Rubber Power Plants

THE power plant of a modern rubber manufacturing plant is so much more economical and efficient than the power plant of ten years ago that the owners of old plants are becoming concerned about the state of affairs. They are wondering what can be done, if anything. Will it be necessary to start all over again and build a new power plant, or can the present plant be rehabilitated? In fact, can it be made better than it was when new, and capable of competing with modern plants? Certainly these are important questions.

My experience has been that in most instances the old plant, particularly the boiler plant, can be brought right up-to-date without great cost. In some instances it can be made better than certain so-called modern plants. And, what is of prime importance, the cost of the modernization will be considerably less than would be the cost of a new plant. As stated by one authority:

> "The vast majority of plants built ten years ago can be reconstructed to produce astonishing savings in power costs. In addition to this fact there has come about a very logical policy of inter-connection between utility and manufacturing plants, whereby it is to the advantage of both parties to work out the most economical local power supply on a co-operative basis."

It must be obvious to any thinking person that heat will pass through an old boiler plate and tube as readily as it will pass through a new plate, provided the plate is kept clean. As a matter of fact there should be a slight improvement with age, because boiler plates and tubes usually become slightly thinner. The boiler whose heating surface does not change with age is a rarity.

Therefore, arrange to keep the tubes perfectly clean inside and out. The modern method is to keep boiler water so pure that no scale will be deposited. Or, install a deconcentrator. By installing a soot cleaner all ash and soot may be kept off the outside of the tubes.

After putting the boiler itself in A-1 condition, get after and improve combustion. It is as important to have complete and proper combustion as it is to have perfectly clean heating surfaces.

Combustion efficiency can almost invariably be improved by increasing furnace volume. This is accomplished by installing modern boiler baffle walls and sometimes modern furnace lining. There must be no air leakage through boiler baffle walls. And there must be no heat leakage through the outside boiler walls. Proper baffle wall design will give the correct gas velocity through the passes of the boiler. There will be no slagging. Flexible joints are advisable so that there will be no cracking or breaking.

Perhaps a steam superheater should be installed. Perhaps a feed water heater. Perhaps an automatic feed water regulator. Or a modern damper regulator, steam purifier, steam trap, automatic combustion control system pump governor, steam flow meter, etc. All of these devices are of great importance in the modernization of power plants. It is possible to do almost anything to an old boiler plant with the exceptions of making the boiler stronger so that steam pressure can be increased.

Comparative Tire Exports

IN the following table, as officially reported by the Department of Commerce, is shown the comparative automobile tire exports from the United States, Canada, United Kingdom and France during the first half of the current year. The Canadian statistics include motorcycle and automobile casings. French export statistics covering pneumatic casings and tubes are officially reported by gross weight only, and therefore the number of automobile casings shown as exported from France to each market is an estimate based on the officially reported weight. The compilation of this table is rendered possible through the purchase of British and French export statistics from a fund established by The Rubber Manufacturers Association, Inc. This comparative table covers but four countries; these four, however, supplied about 80 per cent of the total exports from all countries in the calendar year 1928:

Tire Exports From Principal Producing Countries
First Six Months of 1929

	United States	Canada	United Kingdom	France	Total
British Isles	26,853	25,835	40,544	28,570	121,802
North Europe ...	175,423	103,829	35,484	14,080	328,816
Central America..	18,270	4,679	1,683	1,900	26,532
West Indies	130,937	14,922	8,888	11,420	166,167
South America ..	348,814	286,261	78,502	40,850	754,427
North America ..	144,369	988	6,922	4,100	156,379
Central Europe ..	266,521	65,442	79,071	166,750	577,784
South Europe ...	156,678	40,597	81,786	105,050	384,111
Near East	27,274	4,215	9,913	22,840	64,242
Africa	55,426	93,330	65,136	242,680	456,572
Asia	309,524	178,505	89,634	127,380	705,043
Oceania	15,084	146,090	53,035	26,920	241,129
GRAND TOTAL..	1,675,173	964,693	550,598	792,540	3,983,004

Australia Standardizes Belting

NEW standard specifications for rubber conveyor and power transmission belting have been recently issued by the Australian Commonwealth Engineering Standards Association. It is the policy of the association that British standard specifications should be taken as the basis of consideration for the preparation of Australian standards. In the case of rubber belting no corresponding British standard has yet been published, but the specification for rubber power transmission belting was prepared with the assistance of the India Rubber Manufacturers' Association. Help in the preparation of the specification was also received from the standards of the American Society for Testing Materials.

The specification deals briefly with the construction of the belting, and specifies the condition of fabric, seam strip, minimum distance between joints or transverse splices, freedom from defects, and tolerances on width. Under testing, are clauses covering tensile strength of fabric, elongation, adhesion, and test on the seam strip, and there are also clauses detailing conditions of sampling and the temperature at which tests are to be carried out.

Standardizing Rubber Tiles

THE structural service department of the American Institute of Architects has suggested the opportunity for simplification of sizes, thicknesses, etc., of rubber floor tiles. Their suggestion is based on the result of tests made by the Bureau of Standards. The Department of Commerce is now circularizing the more important manufacturers of this product to find out their opinion on the need for this simplification. If sufficient interest is shown in the project, the Department will organize a preilminary conference to discuss the details.

RUBBER CHEMISTRY and Technology

Rubber and Its Sol and Gel Fractions*

By R. PUMMERER

THE German Rubber Society has kindly asked me to speak on the subject of my work in the field of rubber research. Two years ago in Essen I had the privilege of describing to you my experiments in alkali purification, whereby it is possible to prepare a really pure rubber from preserved latex or revertex.[1] This discovery brought us closer to a much desired goal, namely the possession of a more or less definite starting material in scientific work so that the behavior of less pure material could be studied and predicted better than formerly. To be sure different samples of latex have different properties, and I have already pointed out in the "Berichte"[2] that ammonia-preserved latex purified by the alkali process still contains small quantities of nitrogen, say 0.1% to 0.4%, which apparently are not a part of any protein substance and which therefore cannot be removed by alkali. They have been formed principally by the action of the ammonia preservative on the raw latex. On the other hand, rubber almost free of nitrogen may be obtained by the alkali-purification of revertex S. That is, the nitrogen content is less than 0.04%.

By redissolving gel-rubber we have been able to obtain it with a similarly low nitrogen content. In the latter instance the part which becomes insoluble in ether on storage is much less pronounced than in the case of samples containing 0.15% nitrogen. A sample stored for three months dissolved in ether after three days, although the typical gel lumps were first formed. A sample containing 0.15% nitrogen ordinarily requires three weeks to go into solution, while freshly prepared gel-rubber quickly dissolves forming sol-rubber. The aggregation phenomena are therefore dependent not only on the mode of treatment but also on the gradual development of an associated nitrogen phase.

The separation of pure rubber into its fractions according to the method of Caspari and Feuchter I have already described to you two years ago. The ether-soluble sol-rubber and the much more difficultly soluble gel-rubber have been the subject of further chemical and colloid-chemical researches. With the assistance of F. Mann I have taken various fractions and determined the iodine number and also the oxygen number according to the method of Prileschajew, using perbenzoic acid, in order to see if the fractions differed. Starting with latex purified with alkali (A.L.), revertex (A.R.), crepe rubber, and smoked sheets, we have closely examined the sol- and reprecipitated gel-rubber, and have found that gel-rubber requires more iodine chloride as well as more perbenzoic acid than does sol-rubber.

The values are given in per cent of the theoretical required by a double bond to each C_5H_8 group. The method of Fisher and Gray was employed,[3] using iodine chloride and a chloroform solution. A slight modification was introduced for we did not add potassium iodide solution but dry potassium iodide before adding the water and thiosulfate. In the case of either sol- or gel-rubber, the reaction is complete in four to six hours, provided a homogeneous rubber solution is employed. If solid rubber is thrown into the iodine chloride solution, the reaction requires three days, but the same values are obtained. Indeed, the result is the same no matter whether the iodine chloride is allowed to react on the rubber solution six hours or ninety hours, and no matter whether the reaction takes place at 0° C. or room temperature. According to the literature this is not the case using carbon disulfide, so that chloroform is preferable. The method yields values which agree within ±0.25, so that it is quite satisfactory.

Table I

		Iodine Number		*Oxygen Number*	
				Sol	*Gel*
1. A. L.	Total 101.5	Sol 100.3	Gel 108.6 (–HCl 99.6)	94.6	100.5
2. A. R.	Total 101.9	Sol 100.2	Gel 110.2	94.2	98.55
3. Crepe	Total 100.4	Sol 97.6	Gel 110.3	91.9	98.8
4. Smoked sheets		Sol 97	Gel 102.4		

We then examined the sol-rubbers. Those obtained from A. L. and from A. R. have a value of just 100, while those obtained from crepe rubber and smoked sheets have values somewhat above 97. The first three gel-rubbers lie close together, between 108.6 and 110.2. Smoked sheets is an exception as its fractions differ much less in titer as well as in viscosity. It is considerably homogenized by the smoking process, during which it is warmed a number of days. It does not yield a typical gel-rubber at all, as less gel skeleton is obtained than in the case of crepe rubber. The higher titer of the gel-rubber might be taken to indicate that it is actually more unsaturated than the sol-rubber and therefore contains more double bonds. That is probably not the case. The absorption is almost identical to that of the sol-rubber, and the presence of a conjugated system is excluded. Besides there is no difference in the addition of hydrogen chloride and nitrosobenzene. The contradiction is explained by the fact that sol- and gel-rubber differ fundamentally in the evolution of hydrogen chloride with iodine chloride. In the case of sol- and gel-rubber obtained from A. L. we have determined quantitatively how much HCl is present in the anhydrous chloroform solution before the addition of water. In the case of sol-rubber there is not a trace of acid; in the case of gel-rubber there is a considerable amount, about 5% of the halogen consumed. This hydrogen halide may be due to substitution or cyclization.

If we consider it as substitution, we must subtract it, thereby obtaining an iodine number of 98 to 99.6% for gel-rubber. The determination of the hydrogen halide was carried out by removing the unconsumed iodine chloride with silver powder and then distilling *in vacuo* a third of the chloroform together with the hydrogen chloride into 0.1N NaOH.[4] In this way we were able to explain the results of the iodine chloride reaction physically and chemically so that sol- and gel-rubber have the same number of double bonds. However, this evidence is not conclusive.

What does the perbenzoic acid method say? The gel-rubbers give oxygen values of 98.6 to 100% of the theoretical with the exception of the typical smoked sheets, thereby corroborating the explanation just given for the iodine numbers. Moreover, we have here a clearer distinction in the behavior of sol and gel, whereby the gel is favored. The sol value is 94.6%, so that it is 5 to 6% less than the iodine chloride figure, whereas the corrected iodine value of the gel agrees with the oxygen number. It is frequently observed that perbenzoic acid does not react completely, as, for example, in the case of the limonenes. However, it is very remarkable that the sol does not react completely while the gel does, in view of our assumption of equal quantities of double bonds.

According to Staudinger the evolution of hydrogen chloride on treating with iodine chloride is a sign of cyclicization. Opposed to the view that the gel is derived from the sol through a trace of cyclicization is the fact that the gel has a higher oxygen value than the sol. It is easier to suppose a difference in the configuration (cis-trans) or in the micelles. However, that is only a possibility. The only thing we are certain about is that sol and gel behave

*Translated from Kautschuk, No. 6, 129-132 (1929), by J. P. Fahy.

differently chemically. The high titer to iodine chloride of crude gel-rubber once or twice precipitated is almost constant, the traces of nitrogenous impurities playing no part. Gel-rubber is better characterized by this titer than by its insolubility in ether.

We are able to make a sol-rubber similar to gel-rubber by moderately warming it as shown by H. Kroepelin. Usually, though not always, gel-rubber has two or three times as great tenacity as sol-rubber. If we warm a sol-rubber, obtained from alkali-purified total rubber and having a relative tenacity of 6, for several days at 60° C., its relative tenacity increases about one and one-half times. It matters not whether the heating is continued five days or twenty days, the viscosity increases no further. Therefore, it seems as though an equilibrium is reached after five days or else some transposition is complete. The heating produces another result.

If the alkali-sol showed a normal viscosity before heating, that is if it followed the law of Poiseuille, then after heating this was not the case. However, there are many sol-rubbers which from the first show an abnormal viscosity. The first fraction especially usually shows a higher viscosity than the second, third, or fourth, these three being pretty much the same. Hence we usually use these more uniform fractions for our experiments.

When sol-rubber is warmed its titler also changes, becoming more like that of gel-rubber. When two samples were warmed three and twenty-six days, respectively, naturally with the exclusion of air, the iodine number in both cases increased several per cent.

Indications of increase in viscosity on heating are found in experiments on heating sol-rubber in benzene. In January, Staudinger and Bondy published a work on the "thermal decomposition" of rubber by heating in solvents,[5] as done by Lichtenberg previously.[6] Their experiments led them to believe that the giant macro-molecule of rubber is unstable in boiling benzene, and it was found that the relative tenacity of a one per cent solution of total rubber thus heated gradually decreased from 7 to 3.6 over a period of ten days, whereupon no further change occurred. On heating in xylene or toluene the viscosity decreased still further, though in either case the action ceased after a definite period.

In my opinion these results are fundamentally affected by the fact that it was not possible completely to exclude air during the experiments. Rubber tubes are pretty permeable to oxygen so that on passing carbon dioxide through them for long periods of time rubber oxides have been formed containing 1.5 to 2% of oxygen. Kroepelin and Brumshagen have heated 1% benzene solutions of sol-rubber in the absence of air for one, two, four, eight, and twelve days at 80° C. The material was then immediately cooled with ice water and the viscosity determined. During the first two days the viscosity decreased somewhat, but this decrease was partly equalized by a subsequent increase. One is reminded of the increase in viscosity on heating dry sol-rubber. After twelve days only a decrease of about 15% remained. This decrease is still smaller if the material is not cooled immediately in cold water after heating, but is allowed to cool slowly for three or four hours. A similar observation was pointed out in my first work on rubber in 1922. By cooling suddenly one fixes a certain colloid-chemical system, a different sort of micelle from that obtained by cooling gradually. We consider this a clear indication of the micellar structure of rubber solutions. We must also notice that the cooling effect is as large as the total heating effect, provided that we cool slowly. We consider this as a predominantly colloid-chemical phenomenon, the rubber is cooked "dead" just as it is milled "dead." As the latter process takes place without any increase in temperature, it is the more radical, and the viscosity falls from 7 to 2 and lower. However, the osmotic pressure does not at all indicate smaller molecules; after "dead-milling" it is not greater but remarkably smaller than before. Apparently the osmotic pressure of rubber solutions is above all a measure of the tendency to swell.

This observation agrees with the findings of Caspari,[7] who showed that milled rubber has a lower osmotic pressure than unmilled rubber. Therefore, since the osmotic pressure is probably a measure of the tendency to swell, it can in no way be a reliable measure of the molecular size. Whenever the measurment of osmotic pressure and the cyroscopic measurement contradict each other, we must carefully look for the sources of error in the two methods. Indeed, it is difficult to understand how a molecular weight of a few thousand is obtained cryoscopically and one of 200,000 by the osmotic pressure method. This was found to be the case by Pummerer and Andriessen in some samples of sol-rubber that had been previously dried to constant weight in high vacuum. The cryoscopic value using benzene varied between 2,000 and 8,000, while the osmotic pressure of sol-rubber did not differ essentially from that of total rubber or even that of smoked sheets which was a hundred times more viscous. This contradiction between the two osmotic methods led us to investigate whether or not pure benzene actually crystallizes from benzene solutions of rubber, as is presupposed in osmotic measurements. In three of the cases examined by us this supposition is not warranted, for what crystallizes out is apparently a mixture of benzene and rubber. We have, for example, by cooling a 1% solution of sol-rubber in a molecular-weight apparatus, isolated 33 grams of crystals which for the most part stuck fast to the walls so that the mother liquor could be easily poured off. These crystals (33g.) contained 0.74% rubber, while the mother liquor (49g.) contained 1.22% of rubber. In another instance, when a 0.95% solution was cooled, the crystals showed a rubber content of 0.85%. It is not to be assumed that this rubber only adhered to the benzene crystals. Apparently we have a compound phase of rubber and benzene. It seems to me that this fact is of some importance not only in rubber research but also in work on high-molecular materials such as protein, cellulose, inulin, etc. However, a few such measurements with a sol-rubber specimen are certainly not grounds for considering all cryoscopic results as erroneous, still it must be expressly pointed out that, in view of the above, cryoscopic measurements in colloidal systems can be considered experimental evidence only when it has been shown that the pure solvent crystallizes out. I, myself, together with several co-workers, have published cryoscopic measurements of rubber in menthol and camphor solutions. We cannot say as yet whether or not the behavior of these substances is similar to that of benzene.

In the case of camphor the stoichiometric relationship between concentration and depression is such a good one that I am inclined to credit these values with more importance than those obtained with benzene. I will refute in the "Berichte" the criticisms voiced by Staudinger against the camphor determinations. On melting the camphor even in high vacuum no decomposition products sublime off. On the other hand, I admit that Meyer and Mark are right in distrusting the use of the cryoscopic method in colloidal systems.[8] I consider it possible that the values of 1,200 to 1,500 for the molecular weight of rubber which I obtained cryoscopically using camphor may need to be inflated because the free available solvent is possibly strongly diminished due to the formation of solvates. Thus a molecular weight would be obtained between 1,200 and 5,000, the value estimated by Meyer and Mark from x-ray data. Indeed, I consider even smaller molecular values as agreeing with the x-ray measurements.[9]

The tendency of sol-rubber to crystallize out with benzene in the form of feathery crystals so unusual for benzene may possibly be used in the further purification of the rubber. We hope to obtain the same effect by cooling ether solutions of rubber to low temperatures. A 1% solution of sol-rubber in ether when cooled to –70° precipitates nearly all the rubber. By warming suitably so as to redissolve the major portion of the rubber, at about –40° slender fibers 1 to 2 cm. long could be noticed, which seemed to emanate from a point.

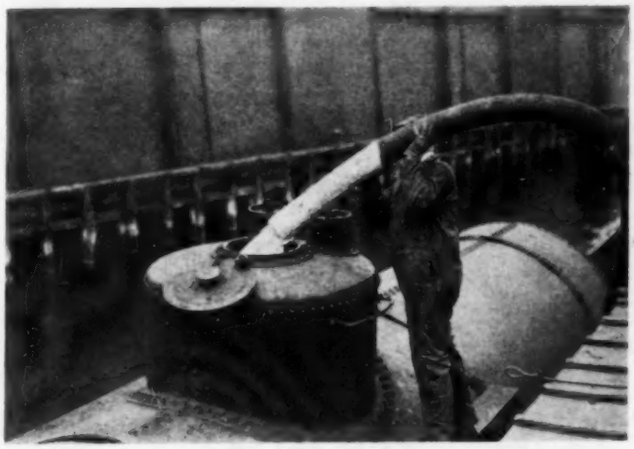
With regard to the chemical structure of rubber, I am still of the opinion I gave in Essen, which is based on the iodine number and on optical data, namely, that rubber cannot be formulated completely without the assumption of rings. Either we have a large ring system composed of many isoprene units or else a long chain with a ring at the end consisting of four, six, eight, or so carbon atoms, which may have been formed by two molecules. The fact that but a small portion of the halogen consumed (in the case of sol-rubber 0.6%) can be split off by water could be easily explained by the second theory. However, it is not permissible to draw stoichiometric conclusions from this discovery until it has been verified in the case of pure crystallized rubber.

Notes

1. *Kautschuk*, **3**, 233 (1927).
2. *Andriessen and Gündel*, Ber. **61**, 1583 (1928).
3. *Ind. End. Chem.*, **18**, 414 (1926).
4. Besides this "dry" acid number we have also determined the "wet" acid number by titrating the acid with 0.1N NaOH after the titration with thiosulfate. The values thus obtained agree remarkably with the perbenzoic acid values provided that one mol of the iodine consumed is subtracted for every two mols of hydrogen halide.
5. *Ann.* **468**, 1 (1929).
6. *Ann.* **406**, 238 (1914).
7. *J. Chem. Soc.* (London) **105**, 2139 (1914).
8. *Ber.* **61**, 1946 (1928).
9. If the contact points of the main valence chains are irregularly distributed, they escape notice in the x-ray diagram. The objection that so many residual valences are not available at the ends of the chains to hold the long chain together can be met by the supposition that a third molecule acts as a binder, as shown by the following diagram:

Trade in Liquid Latex

RUBBER in the form of liquid latex is exported principally from Malaya and Sumatra East Coast. Small quantities have been exported from Ceylon from time to time, but the amount in the past two years has been negligible. According to a recent report on the subject by the Department of Commerce, the United States imports over 90 per cent of the crude rubber shipped in the form of liquid latex; official Malayan statistics for 1928 state that of 919,909 gallons exported the amount shipped to the United States was 803,999 gallons, and quasi-official statistics show that of Sumatran exports of 933,501 gallons in 1928, 928,972 gallons was destined for the United States. The Malayan statistics do not include shipments of rubber in the form of concentrated latex.



Discharging Liquid Latex in New York Harbor

The exports of liquid latex from Malaya and Sumatra are shown below for the months of 1928, and 1929 so far as available. The unit is the imperial gallon, and British authorities calculate the dry rubber content at 3½ pounds per gallon.

Exports of Liquid Latex

1928:	Malaya *Gallons*	Sumatra *Gallons*	Total *Gallons*	Dry Rubber Content *Pounds*
January	105,372	.....	105,372	368,802
February	88,478	.....	88,478	309,673
March	150,113	50	150,163	525,570
April	55,786	55,695	111,481	390,183
May	57,599	54,128	111,727	391,044
June	131,220	55,562	186,782	653,737
July	64,673	200,997	265,670	929,845
August	7,735	199,921	207,656	726,796
September	15,545	107,903	123,448	432,068
October	120,591	184,521	305,112	1,067,892
November	69,347	39,915	109,262	382,417
December	56,450	34,809	91,259	319,406
1929:				
January	162,139	21,541	183,680	642,880
February	131,278	81,129	212,407	743,424
March	104,718	1,044	105,762	370,167
April	79,646	55,608	135,254	473,389
May	116,327	69,419	185,746	650,111
June	170,504	.....	.....	.....

The greater part of this trade is in the hands of the United States Rubber Company, which ships from its own plantations both in Malaya and Sumatra East Coast. Liquid latex is also purchased from other rubber producers and the general form of the contract in such cases may be deduced from the following quotation from remarks of the chairman of Buket Rajah Rubber Co., Ltd., at the last annual meeting: "The latex contract was renewed for the current year. The price is based on the London average for the preceding month, less 1¼ pence per pound for delivery on the estate." By making delivery on the estate, the producing company is saved the expense incident to coagulation, sheeting, drying, smoking, packing, and transportation.

The following table shows the exports of liquid latex in imperial gallons during 1928, according to destination:

To:	*Malaya* *Gallons*	*Sumatra East Coast* *Gallons*
United States	803,999	928,972
United Kingdom	67,088	.....
Continent of Europe	42,421	4,529
Japan	5,217	.....
Other countries	1,184	.....
Total	919,909	933,501

REVIEW DESK

Books, New Publications, Catalogues, Etc.

REPORT OF THE COMMITTEE ON CALENDAR SIMPLIFICATION. By George Eastman, Chairman, 343 State Street, Rochester, N. Y. 1929. 120 pp.

This report to the Secretary of State, made in accordance with a request of the League of Nations, details the favorable aspects of a reformed calendar, but does not include any of the objections commonly made to such a change. The history of the movement for such reform is concluded by recommendations that this country endorse the idea and be represented at an international conference on the subject.

ELECTRIC HEAT FOR INDUSTRY. Published by the Public Service Company of Northern Illinois, 72 West Adams Street, Chicago, Ill. 1929. 32 pp.

Industries are in many cases adopting electric heat in order to profit by more efficient production methods. This booklet pictures the partial extent of this trend in northern Illinois, describing the advantages of electric heat in specific applications.

SOVIET UNION YEAR-BOOK. Compiled and edited by A. A. Santalov and Louis Segal. Published by George Allen & Unwin, Ltd., 40 Museum Street, London, England. 1929. 648 pp.

Despite the fact that American industrial leaders are becoming increasingly aware of the possibilities of the Russian market, comparatively little is known by the general public of the new economic and political order of the Soviet Union. In addition to being an export market, Russia is developing large industries of its own, as is indicated by the fact that 36,248,000 pairs of galoshes, 535,000 tires, and 8,500 tons of other rubber goods were produced there in the 1927-28 fiscal year. This fifth annual edition of the most comprehensive publication of data on Soviet Russia may be obtained from the Amtorg Book Department, 136 Liberty Street, New York City.

Booth of the Crescent Insulated Wire Company at the Recent Electrical Show, Grand Central Palace, New York City

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STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, of THE RUBBER AGE, published semi-monthly at New Brunswick, N. J., for October 1, 1929.

State of New York } ss.
County of New York }

Before me, a notary public in and for the State and county aforesaid, personally appeared Peter P. Pinto, who, having been duly sworn according to law, deposes and says that he is the Business Manager of THE RUBBER AGE and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers, are:

Publisher, Palmerton Publishing Company, Inc., 250 W. 57th St., New York City; Editor, none; Managing Editor, J. P. Bushnell, 250 W. 57th St., New York City; Business Manager, Peter P. Pinto, 250 W. 57th St., New York City.

2. That the owner is (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given):

Palmerton Publishing Company, Inc., 250 W. 57th St., New York City; P. L. Palmerton, 250 W. 57th St., New York City; Earl D. Osborn, 40 E. 36th St., New York City.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are:

None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholders or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contains statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest, direct or indirect, in the said stocks, bonds, or other securities than as so stated by him.

PETER P. PINTO, Business Manager.

Sworn to and subscribed before me this 30th day of September, 1929.

[SEAL] HANNAH GOLDENSON, Notary Public.
(My commission expires March 30th, 1930.)

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EDITORIAL COMMENT

Tire Prices

IT is significant at this time, when the leading tire manufacturers are raising their tire prices, to call attention, by way of justifying such increases, to the recent remarks of R. S. Wilson, general sales manager of the Goodyear Tire and Rubber Company, when he commented on the fact that while costs of food, clothing, housing, fuel, light and sundries today are 60 per cent higher than in 1914, the cost of the automobile tire is 60 per cent less. Mr. Wilson based his statement on Government figures pertaining to commodities and a close check of tire prices ruling at the present time and a decade and a half ago. In the course of his remarks, he said:

"We must not lose sight of the fact that there has been a vast increase in tire mileage in the last fifteen years. In 1914 the life of the tire averaged 4,000 miles. Today the average is over 15,000 miles, so we have the tire of today selling to the car owner at 60 per cent less in price, yet giving an increased service of 300 per cent."

Such statements, coupled with the fact that in the past few years the tire industry has enjoyed but little and scattered prosperity, can go far to justify the recent slight price advances.

Trying to Get Together

THERE has been a great deal of talk during the last fortnight regarding the possibilities of stabilizing the price of crude rubber. Rumors have been rife that the British and Dutch plantation interests are finally going to get together with some comprehensive plan. British interests are also reviving proposals for a central selling combine. But looking back upon similar efforts attempted before and during the years under which the Stevenson plan operated, the present rumors can only make one consider them with skepticism and read of them only with one's tongue in his cheek. Even in spite of the fact that one of the leaders in the American industry is talking along these lines with some evident seriousness, the consummation of any price stabilizing arrangement would seem remote. Not that some such situation is not desirable—a finer thing could not probably happen for the general welfare of the industry, but utopian conditions do not, or never have, prevailed in industrialism.

The interesting note that comes out of all these rumors is the evident reconciliation on the part of the British and Dutch plantation interests that they should be very well satisfied with 22 to 25 cent rubber and can doubtless make a fair profit at that price, a confession that they have been loath to declare heretofore. Probably the greatest factor in preventing the formulation of any selling combine, however, is the picture in the background of dollar rubber which they cannot seem to erase from their minds.

Simplification and Standardization

TO acquaint American business men with the various simplification programs now in effect, the Division of Simplified Practice of the National Bureau of Standards, Department of Commerce, has just announced the availability of complimentary mimeographed schedules of these recommendations.

These mimeographed schedules, called sheet forms, contain the recommended list of sizes and varieties only, as adopted by the industry concerned, and are especially designed for use of engineers, architects, purchasing agents, the personnel of order departments, storekeepers, accountants, foremen and others who are desirous of possessing, in concise form, schedules which are easily adaptable to their filing systems.

A sheet listing the names of all simplified practice recommendations now in effect will be mailed those interested in securing copies of these recommendations in sheet form. From this list recommendations of particular interest may be selected.

The rubber industry has figured to a large extent in the fine results achieved by the Division of Simplified Practice and a great many rubber products have been standardized and standard specifications drawn up for a wide variety of materials used in the industry. A great deal, however, still remains that might be accomplished with a full knowledge of the services and facilities available through cooperation with the Division.

The RUBBER AGE

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NEWS of the INDUSTRY

Financial—Business
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U. S. RUBBER MOVES ITS TIRE STAFF TO DETROIT

Completion of the first step in the move to concentrate all tire activities of the United States Rubber Company at Detroit, Mich., was made early this month with the arrival in that city of executives, office staffs and equipment from the former headquarters of the department at New York City.

L. D. Tompkins, vice-president and general manager of the tire department, headed the group of executives arriving, which included J. F. O'Shaughnessy, an assistant to the general manager; L. M. Simpson, general sales manager; G. N. Walker, advertising manager, and the following staff members of the sales division: W. C. Blake, A. B. Fennel, M. G. O'Harra, H. A. Farr, J. C. Ray, H. N. Hawkes, Charles Samson and W. P. Coghlan.

In addition, members of the office staffs also were transferred, while the remainder of the clerical force is being recruited in Detroit.

Office equipment was transported from former headquarters at 1790 Broadway, New York City, in a fleet of motor trucks, to the new home of the tire department at the factory on East Jefferson avenue, locally known as the Morgan & Wright plant. Two floors of one of the largest buildings in the factory group have been remodeled and made ready for the new offices.

Among the important operations now being carried on here are all tire executive, sales, advertising and accounting activities formerly located in New York, as well as the large development department, tire building activities, field engineering work and the technical service division.

RULES MASON FUND IS TAX FREE FOR RECEIVER

The Mason Tire & Rubber Company, Kent, O., will not have to pay any taxes on funds coming into possession of A. L. Caris as trustee in bankruptcy, according to a decision handed down by Harry L. Snyder, Akron referee, following Caris' petition to the auditor to show cause why such funds should be exempt. An agreed statement of facts filed with Referee Snyder on April 8, 1929, showed that there was in possession of the trustee some $365,000 for distribution, including a dividend fund amounting to $190,000.

The trustee contended that the funds should not be subject to taxation for the reason that the trustee is acting only in the capacity of a liquidating trustee under the jurisdiction of the federal court. County Auditor J. M. Parham said there was no reason why the funds should not be listed as provided in section 5372-1 of the general code of Ohio.

Returns from Argentina

Paul R. Mahoney, executive vice-president of the B. F. Goodrich Company, photographed on the *Calamares* on his arrival at New York following an extensive trip through the Argentine, Peru, Paraguay and Cuba. During his visit, he made arrangements for the construction of a tire and rubber goods factory for his company near Buenos Aires to employ more than 1,000 workers.

SEWER GAS EXPLOSION HITS MILLER HOSPITAL

An explosion of sewer gas shortly before noon on October 19 wrecked the hospital and dispensary of the Miller Rubber Company, Akron, O., tore up solid concrete floors, and started a fire that resulted in damage estimated at $1,500. No one was in the wards or the dispensary when the blast occurred.

Firemen quickly halted the blaze at the Miller hospital, but the building will have to be entirely rebuilt and refurnished. The women's ward and the men's ward partitions were blown down, the concrete floor was raised and split for a distance of ten feet, and the other rooms were wrecked.

Firestone Earns $6,016,527

In the ten months ended August 31, the Firestone Tire & Rubber Company has earned $6,016,527 after all charges, including deduction of expenditures made in connection with the development of the Liberia rubber properties. This compares with $7,072,014 earned in the full year ended October 31, 1928.

M'QUEEN LEAVES GOODRICH, SUCCEEDED BY M'TAMMANY

L. A. McQueen, general manager in charge of tire sales for the B. F. Goodrich Company, resigned from that organization early this month after 13 years of service. He has been succeeded by Robert McTammany, former central district manager of tire sales, according to an announcement made by T. G. Graham, first vice-president and head of the tire sales and production division, on October 9.

Mr. McTammany has been with the Goodrich company for the last 24 years, after serving five years as accountant for the United States Steel Corp. He served as assistant auditor at Goodrich for four years in the Akron offices before becoming chief clerk of the Philadelphia branch.

Following two years at Philadelphia, he was made departmental sales manager and later went to Atlanta as southwastern district manager. His next post was manager of the central district with offices here.

Mr. McQueen leaves the Goodrich company after starting 13 years ago as a clerk and working up to a position as head of one of the chief sales departments. In announcing his resignation late Tuesday, Mr. McQueen said that he had no plans for the future. "First, I'm going to enjoy a vacation," he said.

After being graduated from the Uuniversity of Wisconsin, McQueen came to Goodrich on the recommendation of the university president. In 1923, McQueen was named advertising manager and served in that position until being named general manager of tire sales four years ago. In the later position, he worked under T. G. Graham.

ASKS MILLION DOLLAR HOOD MERGER COMMISSION

Claiming a commission of $1,000,000 for introducing a representative of the Hood Rubber Company, Watertown, Mass., to a New York financier, which resulted in the sale of the Hood company to the B. F. Goodrich Company for $50,000,000, Patrick J. Doherty, a Boston broker, has brought action in the Massachusetts superior court.

Through his attorneys, Mr. Doherty obtained an order of notice from Judge Louis Cox commanding the presence of representatives of the Hood Rubber Company, Hood Rubber Company, Inc., and B. F. Goodrich Company to show why they should not be enjoined from disposing of 100,000 shares of stock in the B. F. Goodrich Company.

H. W. CROYSDALE has been named vice-president in charge of all operations of the Republic Rubber Company. He has been in the rubber industry 23 years and has been with Republic since 1927.

SCRAP RUBBER DEALERS CONDUCT FALL MEETING

Fall meetings of the National Association of Waste Material Dealers, Inc., were held October 22 at the Hotel Astor, New York City. The members of the Scrap Rubber Division met in the morning of that day and discussed several subjects of importance.

Other features of the fall sessions of the association were a members' get-together luncheon and a meeting of the N. A. W. M. D. board of directors.

COLUMBIAN CARBON WILL SELL ADDITIONAL STOCK

The Columbian Carbon Company is offering its shareholders rights to subscribe to 41,161 additional shares of common stock at $175 a share in the ratio of nine new shares for every 100 held. The additional $7,203,175 which this offer will bring to the company will be used for expansion, largely in connection with the natural gas projects in which the company has an interest. The additional stock will increase the amount outstanding to 498,505 no-par shares out of an authorized 500,000.

The carbon black business of the company has displayed increasing growth over the past few years, the volume rising from 64,888,416 pounds produced in 1925 to 79,194,473 pounds last year, which will be exceeded in the current year. Prices of carbon black are lower at present than a few months ago, but sales have increased considerably.

UNITED CARBON COMPANY TO SELL TO THE TRADE

The United Carbon Company, manufacturer of carbon blacks, Charleston, W. Va., which has heretofore marketed its products through selling agents, has decided to change its selling policy and to offer its products direct to the trade. Greater stabilization of the industry and the organization of a number of smaller producing companies into the United Carbon Company are given as the reasons for the change.

"The United Carbon Company now produces about one-third of the world's carbon black," says Oscar Nelson, president and general manager, "and is fortified with gas reserves unexcelled by any other carbon black company; it is adequately financed and efficiently managed and comes to the trade with guaranteed ability to offer excellent service to all customers, being in a position to continue shipments of any grade of black satisfactory to a customer from the same plant over a period of years, thus assuring uniformity of quality."

The United Carbon Company comes into the market as sole owners and producers of the brands: Kosmos brand, formerly manufactured and sold by the Cosmos Carbon Company, Charleston, W. Va.; Dixie brand, formerly manufactured and sold by the United Oil & Natural Gas Products Corporation, Monroe, La.; and Triangle brand, formerly manufactured and sold by Eastern Carbon Black Company (Davis Brothers), Charleston, W. Va.

Harry J. King

Harry J. King, until a year ago plant superintendent of the American Hard Rubber Company, Akron, O., died October 16 at his home in that city after an illness which had extended more than a year and which had necessitated his resigning his position with the rubber factory. He was 56 years old and had lived in Akron practically all his life.

Mr. King started his business career as an office boy nearly forty years ago in what was then the Goodyear Hard Rubber Company. Mergers in 1898 brought in two other concerns, and the American Hard Rubber Company was the result. Mr. King was then active in plant work and he became superintendent when death removed his immediate superior.

Gastex Export Agency

The General Atlas Chemical Company has just completed a contract with the Cookson Produce & Chemical Company, Port of London Building, London, England, for the export sales of Gastex to all foreign countries excepting Canada, Australia and Japan. W. Astles, managing director of the Cookson company, has been in the United States for several weeks negotiating with American manufacturers.

Dovan Gives Up DPG

Effective October 15, the Dovan Chemical Corporation, 30 Church street, New York City, has withdrawn from the trade as suppliers of diphenylguanidine. All Dovan contracts for diphenylguanidine have been taken over by the Roessler & Hasslacher Chemical Company, 10 East 40th street, New York City.

MONSANTO PURCHASES MERRIMAC CHEMICAL CO.

The Merrimac Chemical Company of Boston, one of the oldest chemical manufacturing firms in the New England territory, has been acquired by the Monsanto Chemical Works, St. Louis, Mo.

Merrimac Chemical, which was established in 1853, operates plants at Everett and Woburn, Mass., and is engaged principally in the manufacture and distribution of acids, dyestuff intermediates, heavy chemicals, nitro-cellulose, alcohol, refined sulfur, solvents and a long list of miscellaneous chemical products. The main office is located at 148 State street, Boston.

Under the terms of the proposal, which has been approved by directors of the Merrimac company and ratified by stockholders at a special meeting October 24, Monsanto will issue one and one-fifth shares of common stock for each share of common stock of the Merrimac.

Merrimac's assets total approximately $9,000,000 and Monsanto's assets, after the acquisition, $24,000,000. During the past year Monsanto acquired Rubber Service Laboratories, the Elko Chemical Company and the fine chemicals business of the Mathison Alkali Works. After the merger with Merrimac Monsanto will have outstanding approximately 398,000 shares of common.

MECHANICAL ENGINEERS HOLD MEETING IN AKRON

Nearly 500 members of the central group of the American Society of Mechanical Engineers attended a three-day meeting at the Hotel Portage, Akron, O., from October 21 to 23. The engineers comprising the central group reside in Ohio, Indiana, Michigan, West Virginia, Kentucky and New York. Various sectional meetings were held, visits to Akron factories were conducted, and talks on all phases of engineering work were given, many of them of interest to rubber manufacturers.

On the first day of the session, C. C. Stuber spoke on "Materials Handling in the Plant of the Goodyear Tire & Rubber Company," and C. C. Slusser, also of Goodyear, discussed "Apprenticeship in the Rubber Industry." A dinner, smoker and entertainment at the Firestone Club House that evening was featured by a talk on "Rubber Plantation Development," by Harvey Firestone, Jr., vice-president of the Firestone Plantations Company.

The second day opened with a talk by F. E. Moore on "Conveying in Tire and Rubber Factories." This was followed by a special session devoted to aeronautics in which there were addresses on "Rubber in Airplane Construction," by A. M. Keller; "Airplane Tires and Wheels," by H. F. Schippel; "Akron's Contribution to Lighter Than Air," by Hugh Allen; and "Some Fundamental Economics of Aircraft Operation," by R. H. Upson. A luncheon at the Goodyear plant and an inspection of the Goodyear-Zeppelin Corporation factory were followed by a banquet at the Portage at which P. W. Litchfield, president of Goodyear, and other rubber men were speakers.

The final day featured excursions to the B. F. Goodrich Company plant, the Miller Rubber Company plant, and other factories in the Okron district.

Rubber Stocks Decline

Rubber company stock issues made new lows together with all other securities in the recent bearish market sessions, General Tire & Rubber alone showing gains. The new Firestone 6 per cent preferred issue has been traded on the New York Produce Exchange. Prices of rubber company shares on October 21 compare as follows:

	Last Price		High	Low
	Oct. 21	Oct. 4	—1929—	
Ajax	3⅝	3	11¼	2½
Falls	—	5	11⅝	4
Faultless	—	44	45	30
Firestone	244	235	309	202½
do. new 6% pfd.	98¾	—	—	—
Fisk	6⅝	6⅝	20⅛	6¼
do. 1st pfd.	32¾	33½	72½	27½
General	264	250	298	236
do. pfd.	93½	93	102	93
Goodrich	65	64⅞	105¾	62½
do. pfd.	106	—	115⅛	106
Goodyear Com.	96⅞	94¼	154½	93¼
do. pr. pfd.	99½	98½	104⅞	98¼
India	—	35	73	35
Intercontinental	8¾	8⅝	14¼	8⅛
Kelly Springfield	7½	7⅛	24	7⅛
do. 1st pfd.	40	46	100	40
Lee	9¾	8½	25	8½
Miller	10¾	10⅛	28¾	9¼
do. pfd.	40	40	83	40
Mohawk	20	20	66	19
do. pfd.	—	78	90½	78
Norwalk	1⅜	1⅞	6⅛	¾
Pirelli	56	58	68	50½
Seiberling	24	26	65	25
do. pfd.	—	90	107⅞	90
U. S. Rubber	50½	50⅛	65	42
do. pfd.	73½	72	92⅛	69½

OHIO BUSINESS MEN HOLD MANAGEMENT CONFERENCE

Leaders of commerce and industry throughout Ohio, including representatives of several rubber companies, will convene at the Deshler-Wallick Hotel, Columbus, O., on November 20, for a one-day conference on methods and practices in modern distribution and marketing and to discuss the changing business policies which are being necessitated by the trend toward mass production and mass distribution. The meeting, known as the first Ohio Management Conference, is sponsored by the Ohio Manufacturers Association, Ohio Bankers Association and the Ohio State Council of Retail Merchants, in co-operation with the Metropolitan Life Insurance Company of New York.

The executive heads of nine nationally known organizations are scheduled to address the conference. Among the subjects which these speakers will discuss are the following: Finding the Way Out of the Distribution and Marketing Maze; Building for Profits on the Foundation of Consumer Good Will; The Manufacturer's Responsibility to His Dealers; Tapping the Man-Power Resources in the Sales Organization; What's Ahead in Retail Distribution; The New Co-operation Among the Manufacturer, Merchant and Banker; Gearing Up Transportation to Serve the Distribution Age.

PATENTS ASSIGNED TO AKRON RUBBER FIRMS

Several Akron rubber companies have had new inventions assigned to them this month by patentees. In addition to the rubber manufacturing companies, the Rubber Service Laboratories Company has acquired part rights to three chemical manufacturing processes invented by Winfield Scott of Nitro, W. Va.

Merle C. Scrote, Goodrich employe, has been granted patents on two types of tire making machines, one of which is described as possessing eight and the other seven patentable features. Scrote made his initial effort to obtain a patent Oct. 25, 1927.

The Goodrich company also completed arrangements for taking over a shoe pressing device invented by Charles M. Richardson, superintendent of the footwear division of the Goodrich plant. His patent carries six exclusive features and was first requested in 1927.

John O. Goodwin and Charles W. Leguillon have been awarded a joint patent on a molding apparatus which has been purchased by the Goodrich company.

Tod J. Mell has patented a method and apparatus for producing a "variegated plastic sheet," said to be an essential in rubber manufacture. He was granted eight of his claims to patentable features and his process was acquired by the Goodrich company.

The same concern also obtained rights to four patentable features specified in claims presented to the patent office by John F. Hogan. Hogan's patent involves a calendering method perfected early in 1928.

Alias E. Davidson has obtained a patent on a transmission belt and method of manufacture, and Harvey L. Young, an engineer employed by Goodrich has patented a method and apparatus for dusting the interior of inner tubes.

Expand Belmont Plant

New additions have just been completed at this plant of the Belmont Packing & Rubber Co., Philadelphia, Pa., bringing the manufacturing space up to 110,000 square feet.

Goodyear Entertains Dealers

The Goodyear Tire & Rubber Company plants at Akron were visited by 170 tire dealers from all portions of the country last month, the visitors being the winners of the recent "Zeppelin" sales race. A four-day program of entertainment included rides in the Goodyear airships, inspection of the dirigible hangar, golf, baseball, a barbecue dinner, and other features. The prize winners were addressed by R. S. Wilson, vice-president in charge of sales.

Jenkins Appeals Tax Case

An appeal has been made by Jenkins Brothers, Elizabeth, N. J., of which the Jenkins Rubber Company is a subsidiary, to the United States Board of Tax Appeals from an alleged deficiency of $2,629.95 assessed against the company by the Commissioner of Internal Revenue for the years of 1925 and 1926. The company claims that there was no deficiency in its tax returns for the two years and asked the board to reduce the taxes.

Stokes Completes Additions

The Joseph Stokes Rubber Company, Trenton, N. J., is installing machinery and equipment in its two new additions to its factory property. The company is now operating seven days a week. A new addition has also been completed at the Canadian plant in Welland, Ont.

Murray Has 600 Stores

The Murray Rubber Company, Trenton, N. J., has announced that it has opened more than 600 retail stores throughout the eastern states for the sale of tires and tubes. Earlier this year the company decided to enter the tire chain store field and declared that it would organize a system of 1,000 retail stores.

U. S. Rubber to Build

The United States Rubber Company is having plans prepared for a four-story factory at Passaic, N. J., to cost in the neighborhood of $1,000,000. The company has also awarded the contract for the erection of a one-story, 100 by 105 ft factory at Providence, R. I., to the Cruise Construction Company, Pawtucket, R. I. The cost of this plant will be about $100,000.

Thermoid Company Dividend

Directors of the Thermoid Company, the holding company which controls the Thermoid Rubber Company, Trenton, N. J., have declared an initial quarterly dividend of 50 cents a share on the common stock, placing the issue on a $2 annual basis. The dividend is payable November 1 to stock of record October 15.

GOODYEAR OPENS TERM OF INDUSTRIAL UNIVERSITY

The management school of the Goodyear Industrial University was opened on September 30 by the Goodyear Tire & Rubber Company, with factory foremen and supervisors as students. Registration at Goodyear Hall in Akron, where the university classes are held, indicates the largest enrollment in the history of the institution.

Classes are held every Monday night for one hour, with the term closing next March 24. Among the new courses being offered this year are the personnel development course, personnel relations course, and the technical course. A course in blue print reading also is being given.

Golf Ball Imports Gain

Imports of golf balls during August numbered 370,992, valued at $120,534, a unit value of 32.5 cents per ball as compared to 32.9 cents in July and 30.9 cents in June. The August imports were the heaviest this year, with the single exception of April, and compare with a total of 367,608 balls brought in during July and 283,136 balls imported during August, 1928. All were from the United Kingdom.

Mason Shows Progress

In the few months that the new Mason Tire & Rubber Corporation, Kent, O., has been organized, distribution has been built up appreciably, and the company is announcing a new DeLuxe line of tires and will in the near future bring out a new secondary line. The board of directors, headed by Francis M. Brooke, eastern financier, as chairman, has approved an aggressive policy for increasing the distribution of Mason products along the lines already established.

GOODYEAR SEEKS IDEAS FOR AIRSHIP HANDLING

The Goodyear Tire & Rubber Company announced last month that three prizes totaling $300 will be given employes for the best suggestions on reducing ground handling costs of operating the small airships of the Puritan type. At present a ground crew of about a dozen men is required to take one of the ships out of the hangar and start it off. If a landing is to be made at some distant point, the crew after launching the ship, must take a bus and drive to the landing point. Often the ship has to cruise in the air for an hour or more waiting for the ground crew to arrive and pull it down.

For the best suggestion, Goodyear will give $150. Prizes of $100 and $50 will be awarded suggestions taking second and third places. The contest will close October 31.

Rubber News Around the World

RUBBER SHOES GAINING, SAYS DR. SCHIDROWITZ

Speaking before a well-attended meeting of the Manchester and district section of the Institution of the Rubber Industry on September 26, Dr. Philip Schidrowitz declared that rubber was rapidly displacing leather in the footwear industry. The subject of his talk was "Rubber as a Substitute for Leather."

Dr. Schidrowitz said they could not mass-produce leather as they could rubber. Leather, too, was dependent on climate and on other industries such as the food industry. This was not the case with rubber, whose output was only limited by the nature of the apparatus, and not by the lack of the material itself. Leather was being replaced in the garment industry by rubber. The same thing had taken place in the demand for crepe soles on boots, the public having found out the superior wearing qualities of the rubber type.

Dr. Schidrowitz detailed methods of testing the finished products produced under the modern method of manufacture and the different uses to which the varied forms of rubber were being put. The complaints regarding the overheating of the foot by the use of rubber soles had, he said, practically been overcome in the latest types.

The attitude of the leather trade and the boot manufacturers to this new type of material had been antagonistic from the very beginning. They described it as a passing fad that would go the way of all substitutes once the novelty had worn off. "I think," added the lecturer, "that they are all wrong." The price of leather had dropped, but the sale of rubber material was increasing rapidly all the time. They were only at the beginning. Ten million pairs of rubber footwear were sold in this country last year. A few far-seeing bootmakers within the last year or two had begun to push this new material, and had developed a remarkable sale. Notwithstanding this, the large proportion of manufacturers remained obdurate in their opposition. He did not want to be too optimistic, but he was convinced that the new type of rubber compounding would make headway, and they would find it displacing leather more and more.

Englebert to Build Plant

The Englebert Rubber Works, leading Belgian manufacturer, has decided to erect a new tire factory at Aachen. This will provide for the expansion of the company's production in order to keep up with its rapidly increasing domestic and export trade.

SWEDISH RUBBER MERGER REPORTS TURNOVER GAIN

The Foerenade Gummifabrikernas Aktiebolag—a combine formed in 1927 by three Swedish rubber works, Haelsingborgs Gummifabriks Aktiebolag, at Haelsingborg, Ryska Gummifabriks Aktiebolag, at Malmoe, and Skandinaviska Gummi-Aktiebolag, at Visakfors—has published its report for the first complete year of its activity, July 1, 1928, to June 30, 1929. The net profit for the year is Kr. 2,570,000, mostly earned by the Haelsingborg company, and equivalent to approximately $670,000.

Dividends will absorb Kr. 1,980,000 of the profit, 4.32 per cent being paid on preference shares for the first incomplete year, ended June 30, 1928, and 7 per cent on preference and ordinary shares for the past year. The combine's turnover has risen to Kr. 30,000,000 (about $8,000,000) in spite of keenest competition and safeguarding measures in many foreign countries.

DUNLOP RUBBER PAYS ITS FIRST INTERIM DIVIDEND

The announcement of an interim dividend of 6 per cent on the ordinary Dunlop shares on account of the year 1929 is considered an encouraging indication of the course of the company's business during the first half of the year. It is, of course, an innovation and follows the announcement of Sir Eric Geddes at the general meeting last May that the board intended to accede to the oft-repeated request of shareholders for interim dividend payments.

These payments, he said, would begin this year as soon as the board had been able to satisfy itself as to the likely result of the half-year's trading. But he added that the dividend must not be taken as an indication of the trading results of the company. This presumably referred to the rate of distribution. For 1928, the ordinary dividend was 20 per cent, and for 1927, 25 per cent, so that, with business equal to last year, another 19 or 20 per cent payment for 1929 may reasonably be looked for by stockholders when the time comes.

CITY OF GLASGOW WILL BUILD RUBBER ROADWAY

An area of rubber roadway amounting to about 1,000 square yards will be laid on a busy thoroughfare in the city of Glasgow, Scotland, according to an agreement reached last month by the Glasgow Corporation and rubber paving interests. Rubber Roadways, Ltd., have entered into an arrangement with the North British Rubber Company, Ltd., by which the former company is to subsidize a demonstration of rubber road paving.

The total cost to the Glasgow Corporation will be at the rate of 30s. per square yard, according to the terms of the agreement.

London Broker Moves

George White, Yuille & Company, Ltd., London rubber brokers, moved their rubber sale room and offices to 3 Mincing Lane in that city on September 30. The tea sale rooms and offices of George White & Company will remain at 31 Fenchurch Street.

African Lions Investigate the Rubber Situation

Three African lions toying with a tire belonging to the Colorado-African Expedition, which recently completed a crossing of Central Africa. The tire, a General casing, was lying on the side of an ant-hill when it aroused the lions' curiosity, enabling expedition members to take this picture. It took considerable time to recover the tire.

CATALPO
for
Treads

Names in the News

JOHN A. MACMILLAN, president of the Dayton Rubber Manufacturing Company, addressed a meeting of students of the Fairmount High School, Dayton, O., on October 8, his subject being "The Thirteen-Month Calendar."

E. J. SMAIL, JR., vice-president of the Rubber Service Laboratories Company, was elected treasurer of Air Services, Inc., Akron, O., at the meeting of the board of directors on October 8. He will retire as vice-president of the chemical company early next year to give his entire time to the development of the aviation concern.

ARTHUR H. RAFF has been appointed as Chicago district manager by the Manheim Manufacturing & Belting Co., Manheim, Pa. He was formerly connected with the Gutta Percha & Rubber Manufacturing Co., and with the Victor Balata & Textile Belting Co.

P. A. CRAFTS, well known in the shoe and leather industry, has accepted a position with the new fibre products division of the United States Rubber Company He will make his headquarters at the Cleveland factory, but will spend most of his time at the several branches of the company and with the shoe manufacturers who use the products of the division.

MILTON W. HARRISON, a director of the Seiberling Rubber Company and son-in-law of F. A. SEIBERLING, president of that company, has been chosen as president of Banc-industrial Service, Inc., New York City, an organization formed to aid banks in presenting economic facts before their customers. A testimonial dinner in his honor will be given Mr. Harrison in New York City on October 29.

F. K. ESPENHAIN, executive vice-president of the Fisk Rubber Company, and the other officials accompanying him on his country-wide tour, have been in attendance at the annual Fall district conference of the Fisk sales organization at Cleveland, O., from October 22 to 24. The conference included the entire sales organization of the central and eastern zones. J. G. CASS, Cleveland district manager, was in charge of conference arrangements, and the other officials present included C. M. PIPER, general sales manager; C. H. JOHNSON, advertising manager; N. B. BRODHEAD, commercial tire department manager; J. I. O'BRIEN, accessory department manager; and R. G. BATH, contest and bonus division manager.

C. M. MURPHY, representative of the Goodyear Tire & Rubber Company, sailed on a business trip to East Africa on October 11.

A. A. SPENCER retired last month as assistant treasurer and secretary of the Woonsocket and Millville plants of the United States Rubber Company after 39 years of continuous service. Co-workers presented him with a handsome radio set as a farewell gift on the day of his retirement.

ASPELL IS MANAGER OF GOODRICH TIRE SALES

Appointment of T. A. Aspell, assistant manager of tire sales, automotive division of tire sales, was announced September 30 by President J. D. Tew, of the B. F. Goodrich Company. Mr. Aspell succeeds Harry C. Miller, who died at Detroit September 23, after a short illness.

On July 31 this year, Mr. Aspell finished a quarter of a century with Goodrich. His first experience in rubber was in 1904 with the Consumers New York Rubber Company, early Goodrich distributors in New York. Later he was given charge of commercial tire sales in New York.

During the Villa expedition in Mexico, in 1916, Mr. Aspell was technical advisor for General Pershing's transport corps. During our participation in the World War, he was stationed at Washington as Goodrich representative in all lines. For eight years following the war, he was manager of the truck and bus tire sales division with headquarters in Akron.

January 1st, 1928, Mr. Aspell was made assistant sales manager of the automotive division, which provided him with an opportunity to take active part in the sales activities of the aeronautical division. He is keenly interested in air transportation, and has a wide acquaintance in the field of aircraft manufacturing as well as in the wider field of automobile truck manufacturing.

GEORGE M. TISDALE, director of purchases of the United States Rubber Company, has announced the appointment of four division purchasing agents under the company's new plan of organization—H. GORDON SMITH, fabric division; H. A. JOHNSON, chemical and pigment division; S. C. STILLWAGON, packaging division; and C. L. FOUTZ, fuel and equipment division. A. P. HENRY has been named as assistant purchasing agent for the stationery and office supply division and A. J. MCINTYRE as chief clerk for the clerical and statistical division.

KNUT ECKENER, son of the commander of the *Graf Zeppelin*, arrived in Akron a few days ago to take up his duties with the Goodyear-Zeppelin Corporation. He landed at New York, October 14, on the *Deutchland*.

EDMUND J. DEMPSEY, factory manager of the Phillips-Baker Rubber Company, Providence, R. I., is severing his connection with that firm to accept a position as general footwear factory manager for the Dominion Rubber Company, Ltd., Montreal, Que. He will leave the Phillips-Baker Rubber Company on October 31 to assume charge in Montreal the following day.

GEORGE M. DEMOREST has been appointed by the Palmer-Bee Company, Detroit, Mich., as district representative for Pittsburgh, Pa., and vicinity. Originally connected with the Robbins Conveying Belt Company, Mr. Demorest has been engaged in sales promotion work on speed reducers, power transmission and conveyor equipment for over 12 years, being one of the pioneer sales engineers in that field.

DONALD FAIRBAIRN, who has been associate editor of the *U. S. Tire Retailer*, dealer house organ of the United States Rubber Company, has been appointed an assistant in the sundries and accessories division of the tire department of the company, with headquarters at Detroit, Mich.

H. J. CARROLL, traffic manager of the Goodyear Tire & Rubber Co., was named vice-chairman of the rubber products committee of the Great Lakes Regional Advisory Board at a meeting, October 9. HENRY J. ZIMMERMAN, traffic manager of the B. F. Goodrich Company, is chairman of the committee.

WILLIAM O'NEIL, president of the General Tire & Rubber Company, and T. S. LINDSEY, vice-president of the Kelly-Springfield Tire Company, have been named as directors of the newly organized Remington Automatic Quotation Board Corporation, formed for the purpose of manufacturing automatic stock market price registering boards.

F. A. SEIBERLING, president of the Seiberling Rubber Company and of the Rubber Manufacturers Association, observed his 70th birthday quietly on October 7 at his Akron home, Stan Hywet Hall.

J. S. M. RENNIE, rubber estate agent of Singapore, in a recent letter to the Singapore *Free Press*, urged that financial reports of rubber planting companies be made more comprehensive so as to give shareholders a better idea of the true costs of production.

GEORGE L. MORSE, secretary of the Mason Tire & Rubber Company, Kent, O., was elected a member of the board of directors of that company last month with the official title of operating manager.

F. J. PROVOST has been appointed northwest manager of Raybestos-Manhattan, Inc., with headquarters in Seattle, Wash., according to an announcement by G. E. MOSEL, western manager of the firm. Mr. Provost has long been territory representative for the former Raybestos Company in Washington, Oregon and Idaho.

EDWIN C. HEINKE, for the past two years aviation editor of the Akron *Times-Press*, and previously a member of the Cleveland *Press*, has been appointed a member of the publicity department of the Firestone Tire & Rubber Company. Mr. Heinke is a graduate of Coshocton High School and Ohio State University.

Current Crude Rubber Items

NEW TARIFF CLAUSE MAY AFFECT RUBBER IMPORTS

Serious curtailment of crude rubber imports into the United States is feared by domestic manufacturers as a result of a Senate amendment to the new tariff bill which would exclude from this country all products of plantations where forced or indentured labor is used. This amendment was passed on October 14 on motion of Senator J. J. Blaine of Wisconsin and affects not only rubber, but also tea, coffee, tobacco and many other products.

A few days later, according to newspaper reports, an Akron delegation, including T. F. Doyle, comptroller of the Firestone Tire & Rubber Company, R. H. Miner, of the legal staff of the Goodyear Tire & Rubber Company, and S. M. Jett, secretary of the B. F. Goodrich Company, went to Washington to protest to Senator Simeon D. Fess of Ohio and other members of the Senate. The Rubber Manufacturers' Association is expected to wage a vigorous fight against the clause.

The amendment, as introduced by Senator Blaine, and adopted after some discussion, but without a rollcall, was added to the section which excludes convict-made goods, adding the words "forced labor or indentured labor under penal sanction."

Rubber Futures Higher

Rubber futures on the Rubber Exchange of New York closed on October 19 a half a cent higher in price than on October 3. There was heavy trading on three of the four opening days of the fortnight, with more than 1,000 contracts being sold each day. The table below indicates the daily range of prices and the daily volume of sales.

New Sumatra Company

A new rubber cultivation company under the name of Bogorredjo Cultuur Maatschappij has been established at Amsterdam with a capital of 2,000,000 florins, of which 500,000 florins has been issued. The estate is situated in the Lampongs district of Sumatra, and the managing director is J. N. Burger.

Rubber Latex Tanker

The Aktiebolaget Svenska Ostasistiska Kompaniel of Gotenburg, has recently designed a new type of vessel for the purpose of carrying liquid rubber latex. The ship is fitted with specially built tanks, electrically heated so as to transport latex or cocoanut oil in bulk to any climate in exactly the same temperature and condition as when loaded.

WORLD RUBBER STOCKS DECLINE 15,339 TONS

In the period between February 28 and August 31 of this year, the stocks of crude rubber throughout the world have declined 15,339 tons, according to a table compiled by Henry Gardner & Company, London brokers. At the end of February, world rubber stocks were figured at 279,233 tons, but by the end of August had dropped to 263,894 tons, equal to about four months' requirements for world consumption.

The heaviest decline was in stocks of rubber afloat to the United States, this figure having fallen from 63,825 tons as of February 28 to 41,619 tons on August 31. This was to some extent offset by the steady rise in London and Liverpool stocks which increased in the same period from 29,696 tons to 43,165 tons.

LIVERPOOL STOCK GAINS EXPLAINED BY PRICE CUT

The remarkable rise in stocks of crude rubber at Liverpool this year has been explained by the fact that warehouse charges in that city have been considerably reduced. In September, 1928, when the new Holt's Warehouse at Gladstone Dock was opened, that firm decided that Liverpool should have at least a third of the United Kingdom's rubber stocks and was able to cut the then existing London and Liverpool rate from 60s. to 38s. 6d. a ton, a reduction equal to almost a quarter of a cent a pound on the price of rubber. Although the London charge for handling has since been reduced to 47s. a ton, Liverpool remains the cheaper port.

Until Holt's laid the foundation of this new trade by making its 21s. 6d. price cut, rubber stocks in Liverpool were negligible in comparison with those held in London. At the close of October, 1928, London and Liverpool stocks were 24,207 tons and 2,233 tons, respectively, while at the end of October, 1927, stocks in the two cities were 69,569 tons and 3,015 tons, respectively. As of October 5, 1929, however, London stocks were 43,478 tons while Liverpool stocks had risen to 10,795 tons.

E. Harvey, of Henry Draper & Company, rubber warehouse keepers of the Albert Dock, has said that importers are working on a low margin of profit and naturally wanted the cheapest rate they could get, while at the same time Liverpool's central position is advantageous to Midland manufacturers.

An application for membership in the Rubber Exchange of New York has been received by that body from Paul Rudolph Tiefenbacher of Hamburg, Germany.

Closing Prices on Rubber Exchange of New York, Inc.

FROM OCTOBER 4 TO OCTOBER 19, 1929

		Spot	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Sales*
Oct.	4	19.60	19.60	19.90	20.20	20.40	20.70	21.00	21.20	21.40	21.60	21.80	22.20	22.30	1,292
	5	19.40	19.40	19.70	20.00	20.20	20.50	20.90	21.00	21.40	21.40	21.40	22.00	22.20	148
	7	19.70	19.70	20.10	20.50	20.70	21.00	21.40	21.50	21.70	21.80	21.90	22.10	22.20	1,030
	8	19.90	19.80	20.30	20.70	21.00	21.30	21.50	21.70	21.80	22.00	22.20	22.20	22.30	1,069
	9	19.80	19.70	20.20	20.50	20.80	21.10	21.30	21.50	21.60	21.80	22.00	22.10	22.20	596
	10	19.80	19.70	20.00	20.40	20.70	21.00	21.20	21.40	21.50	21.80	22.00	22.10	22.20	513
	11	19.90	19.90	20.10	20.50	20.70	21.00	21.20	21.40	21.60	21.80	22.00	22.20	22.40	356
	14	20.00	20.00	20.30	20.60	20.90	21.20	21.50	21.70	21.80	22.10	22.30	22.50	22.70	252
	15	20.00	19.90	20.00	20.50	20.60	20.90	21.20	21.40	21.60	21.80	22.00	22.20	22.40	234
	16	19.80	19.80	19.90	20.20	20.40	20.70	20.90	21.10	21.30	21.50	21.60	21.80	22.00	366
	17	19.30	19.30	19.40	19.80	19.90	20.20	20.40	20.70	20.90	21.10	21.20	21.40	21.60	790
	18	19.70	19.70	19.70	20.10	20.30	20.50	20.80	21.10	21.30	21.50	21.60	21.80	22.00	447
	19	19.70	19.70	19.70	20.10	20.30	20.50	20.70	21.00	21.20	21.40	21.60	21.80	22.00	80

*In lots of 2½ tons each

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Rubber Goods and Specialties

India Super Traction Tire

A super traction truck tire has been introduced by the India Tire & Rubber Company, Akron, O. Designed especially for heavy duty use, such as in the building trades and oil fields, this tire is constructed in the following sizes: 34 by 7 in., 38 by 7 in., 36 by 8 in., and 40 by 8 in. The carcass is strong but flexible, and the tough

treads and sidewalls make the tire capable of withstanding continuous curbing and scuffing. The beads are strong and solid and sufficiently wired to hold a strong carcass supporting a heavy load. According to the manufacturer, the big, deep hexagonal stubs of rubber on the tread and the tough elongated fingers on the side will give traction and power under the most adverse conditions.

Goodrich Maxecon Garden Hose

Goodrich Maxecon garden hose, put up in a new gold wrapper, is being widely advertised by the B. F. Goodrich Company, Akron, O., with particular emphasis on the ⅝-inch size. This type of hose has a layer of double cords braided around the tube, then

another layer of rubber, then a layer of heavy single cords around that, and a heavy rubber cover outside. A high pressure cure is used, and the manufacturer states that the water can be shut off at the nozzle or the hose dragged across cinders or concrete without damage to it. The B. F. Goodrich Rubber Company is sending a handsome 32-page illustrated brochure to dealers, outlining a comprehensive merchandising plan for garden hose.

Sport Tred Sole

A new creation among the sport soles and heels of the Dryden Rubber Company, 1014 South Kildare Avenue, Chicago, Ill., is known as the Sport Tred. This is scientifically designed to give the utmost in flexibility and long wear for golf and all types of walking and outdoor shoes. To meet the demand for colored sport soles, this new design is being furnished in a variety of colors, including blue, brown, green, pink, white, black and neutral. It is manufactured in sizes for men's, women's and boys' footwear and, according to the manufacturer, insures to the wearer maximum safety against slipping on the golf course while occasioning no discomfort when used for street wear.

Dunlop Clipper Tire

Under the old name of the Dunlop Clipper, the Dunlop Rubber Company, Fort Dunlop, Birmingham, England, is introducing a new low-priced tire casing to round out its line. The tread design is such as will pro-

vide a secure grip with the requisite durability, and a sufficient range of sizes is being made to cover the requirements of all cars of small and medium sizes. The Dunlop Rubber Company is at present manufacturing its triple-stud casing, the Fort type, and the silent-tread design which is used on certain large cars, and there will be no changes in the design or price of these.

Marking Rubber Goods

A method of marking rubber goods produced through an aqueous dispersions process has been patented by the Dunlop Rubber Company, Ltd., and G. Trobridge, of Fort Dunlop, England. In the manufacture of goods directly from aqueous dispersions, e.g. of rubber, e.g. by dipping, spreading, spraying, but not by electrophoresis, the deposition bases are engraved, embossed, printed or otherwise marked, e.g. with inks or other coloring matter, and produce a corresponding marking on the goods. Rubber goods may be dried and vulcanized on the deposition bases which may be wholly or partly porous and may be of metal, glass or porcelain.

Pirelli Superflex Tire

Pirelli, Ltd., Burton-on-Trent, England, a subsidiary of the Pirelli Rubber Company of Italy, is announcing a new Superflex tire casing which will be introduced at the coming British motor shows. These tires will be made at the new Pirelli factory in a complete range of balloon sizes to fit both well-base and flat-base straight side rims, and

also in certain sizes to fit beaded-edge rims. Pirelli high pressure tires are also being manufactured at the new plant and will be available for all types of rims.

Self-Inflating Airpillo

Constructed of waterproof khaki cloth, reinforced with pure gum rubber, and locked by a nickle-plated crasp, this Airpillo, manufactured by the Waterproof Pocket Corporation, 7 West 22nd street, New York City, has many uses. It serves as a sleeping pillow, as a swimming wing, a sand rest, a life saver, and as a receptacle for food, tobacco or other articles. Loops are provided so that this air bag may be attached to the belt or strapped to the back. It can be used as a cushion in the canoe or a back

rest in the hammock or the motor car and, according to the manufacturer, may be used as an emergency ice bag or hot water bag. It is inflated merely by opening the frame as wide as possible and then locking the latch. The size of this air bag is 12 by 17 inches, but the manufacturer is about to introduce a larger type with a size of 15 by 18 inches.

AMERICAN RUBBER PLANT WILL BE RADIO FACTORY

The plant of the American Tire & Rubber Corporation at 100 Beech street, Akron, O., is to be converted into a radio manufacturing plant by a new company headed by some of the officers of the former tire firm. This was announced late last month by F. C. Snyder, president of the tire company, who will become president of the new business. The new company will be known as the Snyder-Hart Company, Inc., will have a capital of approximately $1,000,000, and will turn out radio sets under the brand name "Shrad."

The American Tire & Rubber Corporation, successor to the American Rubber & Tire Company and the American Tire & Rubber Company, was taken over by the Fidelity Tire & Rubber Company last June and its manufacturing activities transferred to the plants of the latter firm.

Government Specifications

The Federal Specifications Board is submitting to representative manufacturers proposed specifications for steam hose couplings and for pneumatic hose and spray hose couplings. The board will send copies of the proposals to any firm interested and will be glad to receive any comment or suggestions as to changes which may be thought desirable. These comments should be sent to reach the board by November 19 to receive attention from the technical committee considering the subject.

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LATE MARKET PRICES

Crude, Scrap & Reclaimed Rubber - Cottons and Fabrics

NEW YORK, OCTOBER 21, 1929

COTTON

UNDER the continued pressure of hedge sales and further liquidation of speculative long lines, the price of cotton during the past fortnight declined to a new low for the season. Regardless of a statistical position of apparently great strength, sentiment remains bearish even at present low levels. The spot price for middling upland cotton on October 19 was 18 cents as against 18.90 cents on October 4.

Increased consumption is shown by the Census Bureau, which reports 545,644 bales consumed in September as compared with 492,307 bales in September, 1928. On the basis of the last government bureau estimate for a crop of 14,915,000 bales and the carryover on July 31 of about 4,500,000 bales, the season's supply of American cotton will be about 100,000 bales less than last season.

The Federal Farm Board on October 21 moved to provide a 16-cent minimum price for cotton in the ten spot markets in fixing the sums to be loaned on that commodity.

High, low and closing prices quoted on October 21 were as follows:

	High	Low	Close	Close
		Oct. 21		Oct. 7
Oct.	17.94	17.80	17.82	18.84
Nov.	18.13	18.03	17.97	18.85
Dec.	18.13	17.98	18.02	18.89

Tire Fabrics

Consumption of cotton fabric in the tire industry during August amounted to 21,070,377 pounds, as compared with 24,167,681 pounds in the month of July. The total consumption in the first eight months of 1929 amounted to 216,937,827 pounds as against the estimate made in these columns two months ago of 219,000,000 pounds. For the entire year of 1929, the tire industry in this country should consume about 292,500,000 pounds of cotton fabric. Late prices follow:

CORD				
Peeler, carded, 23/5/3	lb.	.47	@	.47½
Peeler, carded, 23/4/3	lb.	.48½	@	.49
Peeler, carded, 13/3/3	lb.	.44½	@	.45
Peeler, carded, 15/3/3	lb.	.43	@	.44
Egyptian, carded, 23/5/3	lb.	.51	@	.52
Egyptian, combed, 28/5/3	lb.	.57	@	.58
CHAFERS				
Carded, American, 8 oz.	lb	.40	@	.41
Carded, American, 10 oz.	lb	.40½	@	.41½
Carded, American, 12 oz.	lb	.40½	@	.42½
Carded, American, 14 oz.	lb	.39	@	.45
LENO BREAKER				
Carded, American, 8¼ oz.	lb.	.40	@	.46
Carded, American, 10¼ oz.	lb.	.40	@	.46
SQUARE WOVEN				
Carded, American, 17¼ oz. 28-11 ply	lb.	.47	@	.48
Carded, American, 17¼ oz. 10-ply	lb	.39	@	.40

Sheetings

Late sheeting prices, as reported by the Textile Brokers Association, follow:

40-inch, 2.50-yard	yd.	—	@	.12⅝
40-inch, 2.85-yard	yd.	—	@	.11¼
40-inch, 3.15-yard	yd.	—	@	.11
40-inch, 3.60-yard	yd.	.09½	@	.09⅝
40-inch, 3.75-yard	yd.	—	@	.09⅜
40-inch, 4.25-yard	yd.	—	@	.08⅞

Ducks

Demand for cotton duck was scattered during the fortnight, buyers filling in here and there on lighter amount of goods. Prices remained unchanged, with the latest quotations being as follows:

Belting and Hose	lb.	.35	@	.36½
Enameling	lb.	.32½	@	.36
Single filling	lb.	.14½	@	.16
Double filling	lb.	—	@	.18

RECLAIMED RUBBER

According to the statistics compiled by the Rubber Manufacturers Association, the consumption of reclaimed rubber in the United States totaled 17,071 long tons during September, as compared with 18,230 long tons during August. Production of reclaim was also lower at 18,660 long tons as against 19,787 long tons in August. Stocks on hand rose to the highest point since late 1927 at 24,984 long tons, a rise of 2,675 long tons from the figure of 22,309 long tons recorded on August 31. September reclaim consumption was equal to 49.2 per cent of crude rubber consumption, while the August percentage was only 47.6. Late prices for the various grades were as follows:

High Tensile				
Super-Reclaim No. 1 Black	lb.	.12¼	@	.12½
Super-Reclaim No. 2 Black	lb.	.11	@	.11½
High Tensile Red	lb.	.12	@	.12¼
Shoe				
Unwashed	lb.	.07	@	.07¼
Washed	lb.	.09¾	@	.10
Tube				
No. 1 (Floating)	lb.	.13	@	.13½
No. 2 (compounded)	lb.	.09¾	@	.10
Tires				
Black	lb.	.07¼	@	.07½
Black, selected tires	lb.	.07½	@	.07¾
Dark Gray	lb.	.09½	@	.10
Light Gray	lb.	.11½	@	.12
White	lb.	.12	@	.12½
Truck, Heavy Gravity	lb.	07	@	.07¼
Truck, Light Gravity	lb.	.07¼	@	.07½
Miscellaneous				
Mechanical Blends	lb	.06½	@	.07
Red	lb.	.12	@	.12¼

Scrap Rubber

There has been a moderate demand for scrap rubber during the fortnight, and this is expected to grow steadily in order to enable reclaimers to prepare for record production schedules next year. Prices for the different grades remained practically unchanged, closing as follows:

(Prices to Consumer)			
Auto tire peelings	ton	42.50	@45.00
Standard White auto	ton	45.00	@47.50
Mixed auto	ton	24.50	@25.00
Bicycle tires	ton	18.50	@20.00
Clean solid truck tires	ton	24.00	@25.00
Boots and shoes	cwt.	1.45	@ 1.50
Arctics, untrimmed	lb.	.00⅞	@ .01
Inner tubes, No. 1	lb.	.08	@ .08¼
Inner tubes, No. 2, compounded	lb.	.04½	@ .04⅝
Inner Tubes, Red	lb.	.05	@ .05⅛
Air Brake Hose	ton	27.50	@30.00
Rubber Hose	ton	17.50	@20.00

CRUDE RUBBER

CRUDE rubber gained a half a cent in price during the fortnight, but still remains below the 20-cent level so far as spot quotations are concerned. Reduction of tire inventories, lessening of the amounts invoiced to the United States and bullishly construed statements such as that of Eric Miller all had their effect in bringing the price to higher levels.

Consumption during the last quarter of the year is expected to be between 102,000 and 103,000 long tons, but heavier imports in the final weeks of 1929 will bring about a decided increase in stocks on hand in this country. As of September 30, the Rubber Manufacturers Association estimates domestic stocks at only 84,362 long tons, the lowest total since January.

At the close of the period, the trade was anxiously awaiting the report of the Dutch Rubber Committee which was scheduled to meet on October 22 on the matter of attempting to stabilize rubber prices. Whether an arrangement can be made for the Dutch and British producers to co-operate is deemed unlikely at the present time.

What may have the most far-reaching effect on the trade of any measures taken in many years has thus far passed practically unnoticed in trading circles. The United States Senate on October 14 approved an amendment to the tariff to exclude from the country all products of indentured or forced labor under penal sanction. This applies to a large part of all rubber produced in the Far East and might possibly result in a scarcity in this country, if strictly enforced, sending prices up to unprecedented heights.

Prices quoted on the New York outside market on October 21 were as follows:

Plantations—			
Ribbed Smoked Sheets—			
Spot-Oct.	.19¾	@	.20
Nov.-Dec.	.20	@	.20⅛
Jan.-Mar.	.20⅛	@	.20⅜
First Latex, crepe spot	.20⅜	@	.21⅛
Amber Crepe, No. 2	.16⅝	@	.16⅞
Amber Crepe, No. 3	.16⅜	@	.16⅝
Amber Crepe, No. 4	.16⅛	@	.16⅜
Brown Crepe, Clean thin	.16¼	@	.16½
Brown Crepe, specky	.16	@	.16¼
Liquid Latex, per gal.	.90		
Paras—			
Up-river Fine	.20	@	.20¼
Up-river Medium	Nominal		
Up-river Coarse	.11	@	
Acre Bolivian, fine	.20¼	@	.20½
Caucho Ball, Upper	.11	@	
Islands, fine	Nominal		
Centrals—			
Central, scrap	.11	@	.11⅛
Esmeraldas	.11	@	.11½
Balata—			
Block, Colombia	Nominal		
Block, Ciudad	.51	@	.52

LONDON MARKET

Standard Ribbed Smoked Sheets—Buyers			
Spot-Oct.		@	9⅜d
Nov.-Dec.		@	9⅞d

SINGAPORE MARKET

Standard Ribbed Smoked Sheets—Sellers			
Spot		@	9⅝d

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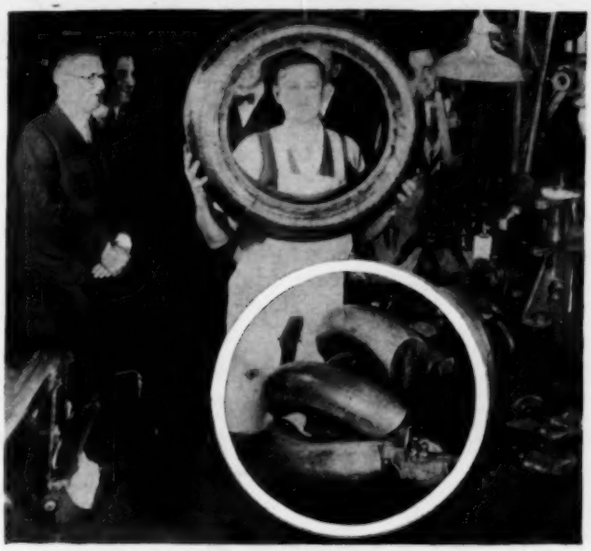

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LATE RUBBER CHEMICAL PRICES

Accelerators — Colors — Softeners — Compounding Materials

NEW YORK October 21—Footwear factories are now in the neighborhood of their peak production, resulting in a demand for rubber chemicals and compounding materials that to some extent offsets the decline in tire output. Mechanical goods plants and other products factories are maintaining good schedules for this time of the year.

During the fortnight has come the announcement that the Monsanto Chemical Works has negotiated for the acquisition of the Merrimac Chemical Company, a maker of rubber compounding ingredients and one of the oldest chemical firms in New England. It is rumored that there may be still further mergers in the industry before the current year is ended.

ACCELERATORS

Organic				
A-7	lb.	.55	@	.59
A-11	lb.	.62	@	.66
A-16	lb.	.57	@	.61
A-19	lb.	.58	@	.62
A-20	lb.	.64	@	.68
Accelerator 102	lb.			
Accelerator 552	lb.			
Accelerator 808	lb.			
Accelerator 883	lb.			
Aldehyde ammonia, crystals	lb.	.65	@	.70
Aniline oil, drums, f.o.b. works	lb.	.15	@	.16¼
Cryiene	lb.	.55	@	.65
paste	lb.	.45	@	.55
Di-Ortho-Tolyguanidine	lb.	.42	@	.52
Diphenylguanidine	lb.	.30	@	.36
Ethylidene anilene	lb.	.45	@	.47½
Formaldehyde aniline	lb.	.34	@	.44
Heptene	lb.	.40	@	—
Hexamethylene-tetramine	lb.	.58½	@	.61
Litnex	lb.	.18	@	.20
Methylenedianiline	lb.	.37½	@	.40
Monex	lb.	3.25	@	—
Oxynone	lb.	.68	@	.80
Para-Nitrosodimethylaniline, f.o.b. works	lb.	.92	@	.96
Piperidine-Piperidyldithio-Carbamate	lb.	4.45	@	4.60
R & H 40	lb.	.40	@	.42½
R & H 50	lb.	.40	@	.42½
R & H 397	lb.	.75	@	.77½
Safex	lb.	1.20	@	1.25
Tensilac, No. 39	lb.	.40	@	.42½
Tensilac, No. 41	lb.	.50	@	.52½
Thermio F	lb.	.50	@	.55
T iocarbanilide, drums	lb.	.25½	@	.28½
Thionex	lb.			
Trimene	lb.	.75	@	—
base	lb.	1.20	@	—
Triphenylguanidine	lb.	.58	@	.62½
Ureka	lb.	.75	@	1.00
Vulcanex	lb.			
Vulcone	lb.			
Vulcanol	lb.			
Waxene	lb.	.30	@	.32
Z 88	lb.	.50	@	.60
Inorganic				
Lead, sublimed blue	lb.	.08¼	@	—
Lead, white	lb.	.10½	@	.12½
Litharge, domestic	lb.	.09	@	—
Magnesia, calcined, light	per 100 lb.	5.35	@	5.45
heavy	per 100 lb.	3.65	@	3.75

COLORS

Blacks (See Compounding Materials)

Blues				
Prussian	lb.	.35	@	.40
Ultramarine	lb.	.06	@	.30
Browns				
Sienna, Italian	lb.	.05½	@	.12½
Umber, Turkey	lb.	.04½	@	.07
Greens				
Chrome, light	lb.	.27	@	.31
medium	lb.	.28	@	.31
dark	lb.	.31	@	.34
Chromium Oxide, bbl.	lb.	.31	@	.38
Reds				
Antimony crimson, 15/17	lb.	.44	@	.50
sulfur free	lb.	.52	@	.60
golden 15/17 F.S.	lb.	.20	@	.25
Indian English	lb.	.08	@	.12
Domestic (Maroon)	lb.	.08	@	.12
Oximony	lb.	.13¼	@	—
Red oxide, pure	lb.	.10	@	.12
Venetian red	lb.	.03	@	.06
Vermillion, quicksilver, English	lb.	1.95	@	—
Whites				
Lithopone, Akrolith	lb.	.05 3/5	@	.06
Lithopone, Albalith	lb.	.05¼	@	.05¾
Lithopone, Azolith	lb.	.05¼	@	.05¾
Lithopone, Vanolith	lb.	.05¾	@	—
Titanox, f.o.b. St. Louis	lb.	.08½	@	.09
Titanium Calcium Pigment, f.o.b. St. Louis	lb.	.09	@	.08½
Zinc Oxide—American Process				
American Azo:				
ZZZ (lead free)	lb.	.06½	@	.07
ZZ (leaded)	lb.	.06⅝	@	.06⅞
Horsehead Brand:				
Special	lb.	.07	@	.07½
XX Green	lb.	.07	@	.07½
XX Red, lead free	lb.	.06½	@	.07
Kadox, black label	lb.	.10⅜	@	.10⅞
blue label	lb.	.09⅜	@	.09⅞
red label	lb.	.08	@	.08½
Zinc Oxide—French Process				
White seal	lb.	.11⅝	@	.11⅞
Green seal	lb.	.10⅜	@	.10⅞
Red seal	lb.	.09⅜	@	.09⅞
Yellows				
Chrome	lb.	.16½	@	.17
Ocher, French medium	lb.	.02	@	.03
domestic	lb.	.01½	@	.02

COMPOUNDING MATERIALS

Aluminum Flake	ton	21.85	@	24.50
Ammonia carbonate	lb.	.10½	@	.12
Asbestine	ton	14.75	@	18.00
Barium carbonate	lb.	.03½	@	.05
Barium Dust	lb.	.05	@	.06
Barytes southern off-color	ton	12.00	@	18.00
Western prime white	ton	23.00	@	—
imported	ton	27.00	@	36.00
Basofor	lb.	.04½	@	—
Blacks				
Arrow "Aerfloted"	lb.	.07	@	.12
Bone Black	lb.	.07	@	.08½
Carbon, compressed	lb.	.06½	@	.12
Carbon, uncompressed	lb.	.06½	@	.11
Disperso	lb.	.11	@	
Drop Black	lb.	.06	@	.10
Fumonex	lb.	.06	@	.09
Gastex	lb.	.04½	@	.08
Lamp Black	lb.	.12	@	.40
Micronex	lb.	.07	@	.12
Velvetex carbon	lb.	.04½	@	.06
Blanc fixe dry f.o.b. works	lb.	.03½	@	.03⅝
Carrara filler	lb.	.01¾	@	.02
Catalpo (fact.)	lb.	.02	@	—
Clay, China, domestic	ton	8.00	@	9.00
Aerfloted Suprex	ton	10.00	@	22.00
Congaree, c. l. f.o.b. mine	ton	9.00	@	—
Lexington	ton	10.00	@	22.00
Mineral Flour, c. l. fob mine	ton	20.00	@	23.00
Tenerite		15.00	@	—
Glues, extra white	lb.	.22	@	.26
medium white	lb.	.20	@	.24
Magnesia, carbonate	lb.	.07	@	.09
Mica (muscovite) 160 mesh White, water grnd., c.l.	lb.	.06	@	—
White, water grnd., ton lots, whse.	lb.	.07	@	—
White, water grnd., less ton lots, whse.	lb.	.08	@	—
Off color (biotite)	lb.	.05	@	.07
Rotten Stone (powdered)	lb.	.02½	@	.04½
Soapstone, powdered	ton	15.00	@	22.00
Starch, powdered	cwt.	3.30	@	3.70
Talc, domestic	ton	12.00	@	15.00
Whiting, commercial	cwt.	.85	@	1.00
English cliffstone	cwt.	1.75	@	2.00
Superfine	ton	10.00	@	12.00
Witeo	ton	12.00	@	—
Wood pulp XXX	ton	45.00	@	—
Wood pulp X	ton	25.00	@	—
Zinc Carbonate	lb.	.09¼	@	.10½
Zinc Stearate	lb.	.23½	@	.25
Zinc Sulfide	lb.	.19	@	.19½

MINERAL RUBBER

Genasco (factory)	ton	50.00	@	52.00
Montezuma, solid	ton	28.00	@	36.00
Montezuma, granulated	ton	32.00	@	42.00
Paradura	ton	62.50	@	65.00
Pioneer, MR, solid	ton	42.00	@	45.00
Pioneer-granulated	ton	52.00	@	55.00
R & H Hydro-Carbon	ton	27.05	@	29.00
Robertson, MR, solid	ton	34.00	@	80.00
M.R. (gran)	ton	38.00	@	80.00

SOFTENERS

Acids				
Nitric, 36 degrees	cwt.	5.00	@	5.25
Sulfuric, 60 degrees	ton	10.50	@	11.50
66 degrees	ton	15.00	@	16.00
Tartaric, crystals	lb.	.37	@	.38
Acids, Fatty				
Stearex	lb.	.15	@	.19
Stearic, double pressed	lb.	.17	@	.22
Alkalies				
Caustic soda, 76%	cwt.	3.76	@	3.91
Soda ash, 58% C.L.	cwt.	1.40	@	
Oils				
Corn, refined, bbls.	lb.	.11	@	.11½
Cottonseed, crude		.08½	@	.08¾
Cycline	gal.	.27	@	.34
Degras (c.l. 100 bbls.)	lb.	.03¾	@	—
Less c. l. (10-25 bbls.)	lb.	.04	@	—
Lots less than 10 bbls.	lb.	.04¼	@	.04½
Fluxrite	lb.	.05	@	.06
Linseed, Raw C.L. bbl.	lb.	.09½	@	.10
Palm Lagos	lb.	.07¼	@	.07½
Niger	lb.	.07¾	@	.08
Vansulol	lb.	.10½	@	—
Para-Flux	gal.	.17	@	—
Petrolatum, white	lb.	.08	@	.08½
dark amber	lb.	.03¾	@	.03¾
Pigmentaroil	gal.	.21	@	.26
Pine, steam distilled	gal.	.65	@	.70
destructively distilled	gal.	.55	@	.58
Witco Palm Oil	lb.	.11	@	—
Witco Softener (f.o.b. works)	lb	.02	@	—
Resins and Pitches				
Pitch, Burgundy	lb.	.06½	@	.07½
coal tar	gal.	.05½	@	.06
pine, 200 lb. gr. wt.	bbl.	9.00	@	10.00
Rosin, grade K, 280 lb.	bbl.	8.55	@	—
Pigmentar	lb.	.038	@	.0446
Solvenol, drums	gal.	.48	@	.50
Tarol, drums	gal.	.30	@	.35
Tar Retort, 50 gal.	bbl.	12.50	@	13.00
Solvents				
Acetone, pure	lb.	.13	@	
Alcohol denatured, No. 1 bbls.	gal.	.37½	@	.44½
Benzol, 90%	gal.	.28	@	—
Carbon bisulphide	lb.	.05½	@	.06¼
Carbon tetrachloride	lb.	.06¼	@	.07
Motor gasoline, steel bbls.	gal.	.17	@	—
Naptha, solvent	gal.	.35	@	.40
Turpentine, spirits	gal.	.60	@	.64
wood	gal.	.50	@	.54
destructively distilled	gal.	.40	@	.43
Waxes				
Beeswax	lb.	.56	@	.58
Carnauba	lb.	.33	@	—
Ceresin, white	lb.	.10	@	.11
Montan, crude	lb.	.07	@	.07½
Ozokerite, black	lb.	.24	@	.25
green	lb.	.26	@	.30
Paraffin (c. l.—f.o.b. N. Y.)				
Yellow crude scale	lb.	.03¾	@	
White crude scale 124/126	lb	.04	@	
Refined, 125/127	lb.	.05¾	@	
Refined, 128/130	lb.	.05¼	@	
Refined, 135/137	lb.	.07¾	@	
Refined, 138/140	lb.	.08¼	@	
Miscellaneous				
RSL Mold Solution	gal	.75	@	.100

ANTI-OXIDANTS

Albasan	lb.	.70	@	.75
Antox	lb.			
Neozone	lb.			
Oxynone	lb.	.68	@	.80
Resistox	lb.	.54	@	.57
Stabilite	lb.	.64	@	—
VGB	lb.	.55	@	.66

SUBSTITUTES

Black	lb.	.08	@	.14
White	lb.	.10	@	.16
Brown	lb.	.08	@	.15

VULCANIZING INGREDIENTS

Sulfur Chloride (drums)	lb.	.03¼	@	.03½
Sulfur flour, Refined, 100% pure (bags)	cwt.	2.40	@	2.75
Commercial (bags)	cwt.	1.75	@	2.10

TIRES & TUBES
CRUDE RUBBER

STATISTICAL SECTION

AUTOMOBILES
GASOLINE

EXPECTED declines in crude and reclaimed rubber consumption were realized when the September figures were made public. The rate of absorption of both by American manufacturers was lower than for any month since last December. It is not likely, however, that domestic consumption during the final three months of 1929 will be any lower on the average than that of September.

While stocks of reclaimed rubber rose 2,000 tons by the end of September, stocks of crude rubber on hand in this country declined abruptly by more than 6,000 tons to the lowest level since last January. This figure will be raised during the final quarter of the year as the heavy September shipments from Malaya begin to arrive at American ports.

Tire production during August was the lowest thus far reported for any month in 1929, and there is little reason to doubt that September output will be recorded as even lower. Tire inventories as of August 31 were the lowest since the end of January, while stocks of inner tubes in the hands of manufacturers were lower than at any time since September 30, 1928.

By a strange coincidence, British stocks of rubber on October 12 were exactly the same as on April 30, 1928, at 55,910 tons and the highest since that date. In April last year London had 53,425 tons of the total and Liverpool only 2,485 tons, but this month London stocks are 44,339 tons and Liverpool stocks up to 11,571 tons.

Latest figures covering imports and exports from the leading producing and consuming countries have been added to the appropriate tables.

PLAN OF THE SECTION

The statistics included in this section have been chosen for their constant importance to the rubber industry. The tables are reprinted in the same relative position in every issue, each table being kept current by the addition of new figures as soon as they become available. The section accordingly affords the most up-to-date, complete and convenient statistical service in the industry.

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U. S. Imports and Exports of Crude Rubber

	Gross Imports			Re-exports			Net Imports
YEARS	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons
1921	185,394	73,772,677	17.76	5,716	2,414,924	18.86	179,678
1922	301,076	101,843,188	15.10	4,809	1,921,828	17.84	296,267
1923	309,144	185,060,304	26.72	8,772	5,672,319	28.87	300,372
1924	328,056	174,231,331	23.71	10,309	6,057,637	26.23	317,747
1925	396,642	429,705,014	48.36	14,827	19,847,753	59.76	381,815
1926	413,338	505,817,807	54.63	17,671	22,470,583	56.77	395,667
1927	426,258	339,874,774	35.60	27,775	24,715,488	39.76	398,483
1928	439,731	244,854,973	25.03	32,159	18,128,361	25.17	407,572
1927:							
Jan.	43,340	36,753,719	37.86	1,525	1,444,734	42.28	41,815
Feb.	28,337	23,110,257	36.41	2,451	2,277,297	41.47	25,886
Mar.	35,515	28,693,016	36.07	2,763	3,249,665	52.50	32,752
Apr.	46,202	37,321,505	36.06	1,575	1,428,425	40.48	44,627
May	36,518	30,984 377	37.88	2,782	2,501,562	40.14	33,736
June	33,045	27,850,014	37.62	1,775	1,550,592	39.00	31,270
July	37,677	31,678,259	37.53	1,958	1,560,853	35.59	35,719
Aug.	32,810	26,396,931	35.92	1,809	1,382,768	34.12	31,001
Sept.	33,301	25,314,412	33 94	3,500	3,036,929	38.74	29,801
Oct.	30,184	22,163,282	32.78	2,513	2,042,713	36.29	27,671
Nov.	38,592	27,395,428	31.69	2,469	2,014,196	36.43	36,123
Dec.	30,737	22,213,574	32.26	2,655	2,245,754	37.77	28,082
1928:							
Jan.	39,107	30,278,444	34.56	1,988	1,734,990	38.95	37,119
Feb.	33,663	27,763,655	36.82	2,738	2,229,589	36.35	30,925
Mar.	40,611	32,103.042	35.29	3,718	2,587,435	31.07	36,893
Apr.	37,935	27,287.266	32.11	2,272	1,415,024	27.80	35,663
May	31,059	19,058,672	27.39	2,399	1,386,307	25.80	28,660
June	27,765	14,121,219	22.71	2,621	1,400,697	23.86	25,144
July	31,258	14,144,765	20.20	3,087	1,451,446	20.99	28,171
Aug.	31,204	12,860,150	18.39	2,377	1,084,646	20.37	28,827
Sept.	39,835	16,512.019	18.50	3,038	1,384,148	20.34	36,797
Oct.	44,058	18,200.332	18.44	2,405	1,085,407	20.15	41,653
Nov.	36,519	14,878,441	18.19	2,788	1,207,089	18.52	33,731
Dec.	43,511	17,580,966	18.04	2,738	1,165,743	19.00	40,773
1929:							
Jan.	57,564	22,872,943	17.74	3,663	1,773,401	21.61	53,901
Feb.	64,265	24,760,111	17.20	2,955	1,374,783	20.77	61,310
Mar.	50,604	20,380,905	17.98	4,218	2,094,037	22.16	46,386
Apr.	55,725	25,542,726	20.46	3,293	1,624,237	22.02	52,432
May	51,161	24,355.511	21.25	2,386	1,349,690	21.24	48,325
June	41,663	18,799,307	20.14	3,152	1,470,746	20.83	38,511
July	43,944	19,342,147	19.65	3,424	1,590,411	20.73	40,520
Aug.	37,222	16,530,090	19.83	2,644	1,232,217	20.80	34,578
Sept.							
Oct.							
Nov.							
Dec.							

U. S. Consumption of Crude Rubber

(Rubber Manufacturers' Association statistics raised to 100 per cent—All figures in long tons)

Figures on Monthly Basis

	1922	1923	1924	1925	1926	1927	1928	1929
Jan.	16,938	30,106	29,058	29,638	32,196	31,518	34,403	43,002
Feb.	14,767	30,149	25,736	19,761	31,136	30,137	33,702	41,594
Mar.	21,408	36,629	28,385	33,498	32,936	36,141	35,688	44,780
Apr.	19,294	29,085	27,129	34,139	32,696	35,871	32,772	47,521
May	23,246	36,155	25,845	35,322	29,364	34,592	37,333	49,233
June	31,713	24,272	22,753	35,822	28,598	33,801	37,676	48,227
July	24,522	17,685	23,396	36,053	27,577	29,219	37,407	41,526
Aug.	29,631	20,359	28,982	35,909	34,533	33,460	42,927	38,274
Sept.	24,410	17,594	31,497	31,691	32,904	27,214	39,882	34,707
Oct.	26,881	21,321	31,520	29,047	29,836	26,790	40,857	
Nov.	24,950	20,437	27,289	28,853	28,080	26,792	37,461	
Dec.	25,070	31,902	27,199	28,748	26,293	25,492	31,232	
Totals	282,560	305,694	328,769	388,481	366,149	371,027	441,340	

Figures on Quarterly Basis

Quarter	1922	1923	1924	1925	1926	1927	1928	1929
Jan./Mar.		96,776	87,609	95,263	94,301	99,216	103,558	128,565
Apr./June	127,360	89,493	75,674	104,099	87,109	103,242	103,500	139,292
July/Sept.		55,621	83,813	99,493	93,793	89,210	117,573	
Oct./Dec.	155,067	63,617	92,656	85,789	83,212	80,860	117,597	
Totals	282,427	305,507	339,752	384,644	358,415	372,528	442,227	267,857

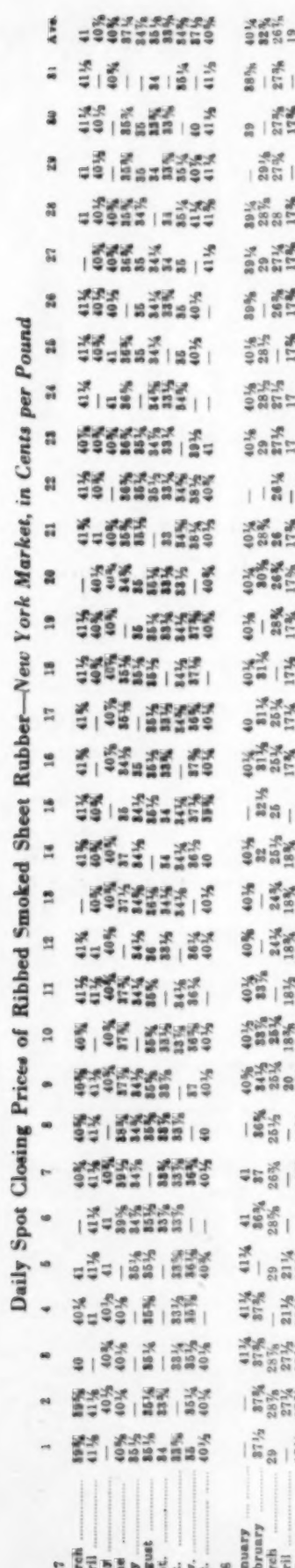
Note—The Rubber Association estimates its monthly rubber consumption figures to be 90 per cent complete. Up until 1925 the quarterly figures were likewise estimated to be 90 per cent complete; beginning with 1925 an estimate of 92 per cent completeness has been used. These estimates have been used in raising the figures in this table to 100 per cent. The quarterly figures are generally regarded as the most authentic; the monthly figures may be accepted as preliminary.

Rubber Invoiced to the U. S.

(Reported by American Consuls—Quantities in Long Tons)

During the Week Ended	From Br. Malaya	From Ceylon	From Dutch East Indies	From London & Liverpool	Total
July 20	5,107	839	1,313	56	7,315
July 27	6,649	432	1,988	75	9,144
Aug. 3	4,784	780	1,251	10	6,825
Aug. 10	5,850	873	1,222	—	7,945
Aug. 17	5,444	593	1,444	33	7,514
Aug. 24	5,560	602	1,401	23	7,586
Aug. 31	5,408	657	1,338	3	7,406
Sept. 7	8,313	1,691	1,256	38	11,298
Sept. 14	7,318	1,080	1,674	37	10,109
Sept. 21	7,514	533	1,549	15	9,611
Sept. 28	6,861	1,975	1,456	140	10,432
Oct. 5	7,913	1,748	1,632	52	11,345
Oct. 12	6,639	1,216	1,462	65	9,382

Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—*New York Market, in Cents per Pound*



Average Spot Closing Prices—Ribbed Smoked Sheets

(New York Market)

Average Price per Pound for Years 1910-1921

Year	Cents	Year	Cents	Year	Cents
1910	206.60	1914	65.33	1918	60.15
1911	141.30	1915	65.85	1919	48.70
1912	121.60	1916	72.50	1920	36.30
1913	82.04	1917	72.23	1921	16.36

Average Monthly Price per Pound Since 1922

Months	1922 Cents	1923 Cents	1924 Cents	1925 Cents	1926 Cents	1927 Cents	1928 Cents	1929 Cents
Jan.	18.82	32.73	25.86	36.71	79.50	38.75	40.25	20.14
Feb.	16.12	35.14	25.29	36.01	62.25	38.25	32.75	23.97
Mar.	14.53	34.21	22.83	41.00	59.00	41.04	26.82	24.55
Apr.	15.99	32.48	22.51	43.64	51.25	40.86	18.97	21.13
May	15.25	27.39	18.89	58.47	47.75	40.76	18.99	21.46
June	15.11	26.88	18.81	77.26	42.50	37.25	19.59	20.64
July	14.67	26.10	22.16	103.16	41.03	34.87	19.40	21.30
Aug.	13.93	28.84	26.17	82.99	38.50	35.12	19.46	20.89
Sept.	14.44	28.95	27.56	88.88	41.00	33.67	18.47	20.37
Oct.	19.78	26.93	31.13	98.01	42.50	34.32	18.83	——
Nov.	23.88	27.14	34.33	104.80	38.50	37.58	18.26	——
Dec.	27.42	26.60	37.88	98.51	38.25	40.63	17.97	——
Average for Year	17.50	29.45	26.20	72.46	48.50	37.72	22.48	——

London Closing Prices of Ribbed Smoked Sheet

(In Pence Per Pound)

Day	July	Aug.	Sept.	Oct.	Day	July	Aug.	Sept.	Oct.
1	10⅝	11	—	9¾	17	11	10¼	10¼	9⅝
2	10⅞	11	10¼	9½	18	10⅞	—	10½	9⅝
3	10⅞	—	10⅛	9⅝	19	10⅜	10⅛	10¼	—
4	10⅞	—	10¼	9½	20	10⅜	10¼	10¼	—
5	11	—	10⅛	9¾	21	—	10¼	10¼	—
6	11¼	10⅞	10⅛	—	22	11	10⅛	—	—
7	—	10⅞	10⅛	9¾	23	11	10¼	10¼	—
8	11½	10⅜	—	10	24	10⅞	10⅜	10¼	—
9	11½	10¾	10⅛	10	25	11	—	10⅛	—
10	11½	10¾	10¼	9⅞	26	11⅜	10⅜	10	—
11	11½	—	10¼	9⅞	27	11¼	10⅜	10	—
12	11¼	10⅝	10¼	10	28	—	10½	9¾	—
13	11¼	10⅝	10¼	—	29	11	10⅜	—	—
14	—	10⅝	10¼	10	30	11	10¼	9¾	—
15	11¼	10½	—	10	31	11	10¼	—	—
16	11	10⅜	10¼	9⅞					

Average Monthly Price Per Pound

Month	1927 Pence	1928 Pence	1929 Pence	Month	1927 Pence	1928 Pence	1929 Pence
Jan.	19.410	19.310	9.942	Aug.	17.202	9.300	10.505
Feb.	19.021	15.713	11.875	Sept.	16.298	8.530	10.160
Mar.	20.125	12.736	12.135	Oct.	16.366	8.807	——
Apr.	19.897	8.864	10.490	Nov.	18.159	8.596	——
May	19.769	8.845	10.717	Dec.	19.690	8.570	——
June	17.880	9.293	10.580	Average for Year	18.375	10.656	——
July	16.770	9.312	11.065				

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market)

Recent Daily Price Per Pound

Day of Month	Sept.	Oct.	Day of Month	Sept.	Oct.	Day of Month	Sept.	Oct.
1	——	18.80	11	18.75	18.55	21	18.55	——
2	——	18.95	12	18.70	18.55	22	——	——
4	19.55	18.90	13	18.70	——	23	18.55	——
4	19.25	18.90	14	18.70	18.35	24	18.45	——
5	19.10	19.00	15	——	18.35	25	18.85	——
6	19.20	——	16	18.70	18.25	26	18.70	——
7	19.20	19.10	17	18.70	18.00	27	18.70	——
8	——	18.65	18	18.60	18.00	28	18.70	——
9	19.35	18.65	19	18.65	——	29	——	——
10	18.95	18.65	20	18.65	——	30	18.70	——
						31	——	——

Average Monthly Price Per Pound

Month	1927 Cents	1928 Cents	1929 Cents	Month	1927 Cents	1928 Cents	1929 Cents
Jan.	13.42	19.12	20.22	Aug.	20.04	19.28	18.62
Feb.	14.10	18.40	20.21	Sept.	21.95	18.67	18.83
Mar.	14.32	19.38	20.19	Oct.	20.22	19.62	——
Apr.	14.75	20.63	20.29	Nov.	20.22	19.54	——
May	16.07	21.58	19.41	Dec.	19.58	20.22	——
June	16.85	21.50	18.74	Average for Year	17.49	19.97	——
July	18.00	21.36	18.62				

Stock of Crude Rubber in the U. S.

(All Quantities in Long Tons)

At	ON HAND			AFLOAT			ON HAND AND AFLOAT		
End of	1927	1928	1929	1927	1928	1929	1927	1928	1929
Jan.	76,172	110,244	76,342	45,312	41,256	78,596	121,484	151,500	154,938
Feb.	91,186	108,955	90,058	42,166	43,816	63,825	133,352	152,271	153,883
March	85,740	114,061	100,536	49,600	39,324	56,476	135,340	153,385	157,012
April	92,757	113,083	107,659	38,963	33,986	55,409	131,720	147,069	163,068
May	94,568	105,356	97,192	44,181	34,374	55,404	138,744	139,730	152,596
June	89,250	90,198	92,061	47,233	40,001	46,035	136,483	130,119	138,096
July	98,469	88,242	92,535	40,687	42,804	38,858	139,056	125,546	134,393
Aug.	96,148	68,994	90,769	40,937	51,875	41,618	137,085	120,869	132,387
Sept.	97,829	68,851	84,362	37,966	48,566	49,480	135,793	117,417	133,842
Oct.	97,453	66,421		42,804	41,571		140,256	107,992	
Nov.	101,034	61,956		37,076	68,119		138,110	130,075	
Dec.	100,130	66,166		47,988	68,764		148,068	134,930	

(Rubber Manufacturers' Association figures raised to 100%.)

Stock of Crude Rubber in London

(No. of tons in Wharves and Warehouses, including Latex)

At end of:	1921	1922	1923	1924	1925	1926	1927	1928	1929
Jan.	56,573	67,252	73,498	57,460	27,172	9,994	54,994	66,524	25,191
Feb.	59,439	67,623	70,483	56,732	23,425	10,004	58,826	62,964	25,554
Mar.	63,913	66,670	63,438	55,647	18,104	13,127	63,055	58,272	28,214
Apr.	68,759	68,637	58,770	54,559	12,949	18,773	66,897	53,425	31,368
May	70,403	70,146	54,439	51,615	5,895	20,384	67,169	44,628	31,290
June	69,408	71,597	51,050	51,115	5,318	23,984	63,902	38,756	31,025
July	71,065	71,515	49,937	52,073	4,258	27,727	63,717	35,429	30,050
Aug.	73,211	72,112	58,427	49,700	4,619	30,165	64,491	32,084	35,605
Sept.	72,175	70,977	54,523	44,011	5,453	35,077	68,236	31,440	
Oct.	69,229	68,536	58,891	37,523	5,086	42,138	69,569	24,207	
Nov.	70,786	68,548	60,074	33,593	3,869	44,057	67,050	17,775	
Dec.	69,792	72,299	60,246	29,488	5,697	48,918	63,793	19,815	

At End of Recent Weeks

	First Saturday	Second Saturday	Third Saturday	Fourth Saturday	Fifth Saturday
1928					
October	29,525	27,370	26,477	24,240	
November	22,919	21,494	20,194	18,724	
December	16,855	16,517	17,669	18,821	19,727
1929					
January	21,953	23,016	23,547	24,423	
February	25,389	25,413	24,757	25,005	
March	25,441	25,920	26,442	27,656	28,077
April	28,934	30,446	30,503	31,213	
May	31,580	31,127	30,955	30,893	
June	31,539	31,635	31,127	30,617	30,982
July	29,996	30,661	30,790	30,167	
August	30,937	31,444	33,573	34,651	35,605
September	36,620	37,901	40,151	42,077	
October	43,478	44,339			

Rubber in Singapore and Penang

(Stocks held by Dealers—Quantities in Long Tons)

End of	1927	1928	1929	End of	1927	1928	1929
Jan.	25,440	25,868	29,617	July	22,558	18,663	33,859
Feb.	26,766	22,867	32,373	Aug.	25,764	18,971	30,884
Mar.	27,844	20,538	29,437	Sept.	25,178	14,898	27,108
Apr.	24,543	16,946	26,474	Oct.	25,790	12,149	—
May	25,133	17,437	30,764	Nov.	28,369	29,188	—
June	21,898	18,207	30,403	Dec.	25,798	32,895	—

Rims Inspected and Passed in U. S.

(Tire and Rim Association Reports)

	Total	Per Cent Balloons		Total	Per Cent Balloons
1923	23,140,620	0.6	1926	24,199,524	78.8
1924	21,868,311	19.7	1927	19,700,003	79.1
1925	26,001,664	66.8	1928	24,247,282	81.6
1928			1929		
January	1,835,207	79.4	July	1,896,666	78.2
February	2,265,024	80.8	August	1,570,099	79.4
March	2,613,389	80.4	September	2,110,003	80.7
April	2,729,899	81.3	October		
May	2,574,224	76.5	November		
June	2,184,219	75.3	December		

U. S. Consumption of Gasoline

(In Barrels of 42 Gallons)

MONTHS	1925	1926	1927	1928	1929
January	14,386,000	17,582,000	17,388,000	20,938,000	22,602,000
February	13,210,000	15,814,000	18,240,000	21,136,000	22,776,000
March	14,890,000	19,302,000	22,464,000	24,041,000	28,492,000
April	19,013,000	20,848,000	23,371,000	25,712,000	32,019,000
May	20,459,000	24,213,000	26,579,000	27,355,000	34,117,000
June	20,724,000	23,803,000	27,799,000	29,022,000	33,163,000
July	22,879,000	24,752,000	29,784,000	30,960,000	36,860,000
August	22,323,000	26,912,000	29,779,000	33,148,000	37,759,000
September	20,177,000	22,929,000	28,409,000	29,691,000	
October	19,826,000	23,973,000	25,497,000	30,610,000	
November	18,024,000	20,618,000	24,400,000	26,222,000	
December	17,954,000	21,419,000	23,718,000	26,644,000	
TOTAL	223,865,000	262,165,000	297,928,000	327,932,000	

U. S. Tire and Tube Statistics

(All Figures Represent Thousands)

AUTOMOBILE CASINGS

Figures for Recent Years

	1922	1923	1924	1925	1926	1927	1928
Production	40,932	45,259	51,633	60,845	61,237	64,439	77,944
Shipments	39,987	45,204	50,120	59,262	59,002	64,059	74,296
Inventory[2]	6,132	5,772	7,427	8,142	10,456	10,264	13,624

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1927	1928	1929	1927	1928	1929	1927	1928	1929
Jan.	4,965	5,358	6,722	4,932	5,394	6,626	10,432	9,949	13,712
Feb.	5,095	6,363	6,912	4,458	5,031	5,282	11,075	11,721	15,495
Mar.	6,276	6,819	7,519	5,701	5,731	6,708	11,668	12,389	16,351
Apr.	6,299	6,178	7,884	5,701	5,812	7,294	12,122	12,71.	16,929
May	6,151	6,759	8,145	5,657	6,457	7,184	12,462	13,024	17,849
June	6,202	6,692	7,304	6,253	7,117	7,254	12,462	12,162	17,957
July	5,987	6,498	6,475	5,973	7,895	7,855	11,326	11,157	16,830
Aug.	5,752	7,469	5,806	6,393	8,403	7,845	10,721	10,034	14,226
Sept.	4,822	6,802		5,717	7,145		9,722	9,765	
Oct.	4,773	7,326		4,799	5,717		9,665	11,520	
Nov.	4,502	6,075		4,306	4,998		10,136	12,579	
Dec.	4,497	5,605		4,165	4,591		10,264	13,624	

AUTOMOBILE INNER TUBES

Figures for Recent Years

	1922	1923	1924	1925	1926	1927	1928
Production	50,850	60,116	70,706	82,614	76,618	70,823	80,180
Shipments	49,673	59,072	68,016	81,004	71,591	72,896	77,127
Inventory[2]	7,643	8,425	11,052	11,313	16,200	13,692	16,117

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1927	1928	1929	1927	1928	1929	1927	1928	1929
Jan.	5,337	5,441	6,517	6,016	6,072	7,242	15,585	12,982	15,386
Feb.	5,658	6,895	6,769	5,120	5,431	5,278	16,075	14,650	16,999
Mar.	7,184	6,231	7,466	6,157	5,731	6,737	17,096	15,573	17,750
Apr.	7,373	6,661	7,634	6,359	5,702	7,164	17,801	16,688	18,134
May	6,737	7,168	7,660	6,140	6,300	7,038	18,389	17,702	18,928
June	6,306	6,953	6,978	6,832	7,136	6,950	17,858	17,159	18,741
July	5,284	6,674	6,178	7,070	8,729	8,113	16,004	14,974	16,832
Aug.	6,480	8,343	5,846	7,983	9,350	8,183	14,664	13,981	14,157
Sept.	5,651	7,103		6,758	7,154		13,511	13,543	
Oct.	5,065	6,929		5,024	5,662		13,539	15,285	
Nov.	4,775	5,592		4,723	5,002		13,585	15,743	
Dec.	4,969	5,184		4,712	4,858		13,692	16,117	

(1) Rubber Manufacturers' Association figures, raised to 100%. The Association estimates its figures to be 75% representative or complete when issued and that basis has been accepted when preparing the statistics in this table.

(2) Held by manufacturers at end of period indicated.

Automobile Production

	United States			Canada			
	Total	Passenger Cars	Trucks	Total	Passenger Cars	Trucks	Grand Total
1922	2,547,208	2,302,923	244,285	102,053	94,904	7,149	2,649,261
1923	4,020,255	3,631,728	388,527	146,438	129,228	17,210	4,166,693
1924	3,600,918	3,203,049	397,869	185,246	117,765	17,481	3,786,164
1925	4,265,704	3,760,459	505,245	161,389	139,311	22,078	4,427,093
1926	4,298,799	3,808,753	490,046	205,092	164,483	40,609	4,503,891
1927	3,393,887	2,938,868	453,019	179,426	146,870	32,556	3,573,313
1928							
Jan.	225,039	199,032	26,007	8,463	6,705	1,758	232,502
Feb.	323,368	290,830	32,358	12,504	10,315	2,189	335,872
March	412,825	371,408	41,417	9,724	7,478	2,246	422,549
April	409,948	364,877	45,071	24,240	20,546	3,694	434,188
May	425,990	375,798	50,192	33,942	29,764	4,178	459,932
June	396,967	356,439	40,528	28,399	25,341	3,058	425,366
July	390,445	237,933	52,512	25,226	20,122	5,104	415,671
Aug.	458,429	400,689	57,740	31,245	24,274	6,971	489,674
Sept.	413,722	358,872	54,850	21,193	16,572	4,621	434,915
Oct.	397,096	339,976	57,120	18,536	13,016	5,520	415,632
Nov.	256,936	217,256	39,680	11,769	8,154	3,615	268,705
Dec.	233,135	205,144	27,991	9,425	6,734	2,691	242,560
TOTAL	4,357,384	3,826,613	530,771	242,382	196,737	45,645	4,599,944
1929							
Jan.	402,154	350,617	51,537	21,501	17,164	4,337	423,655
Feb.	466,084	407,589	58,495	31,287	28,486	2,801	497,371
March	584,733	513,266	69,559	40,621	32,833	7,788	625,354
April	620,656	538,679	81,977	41,901	34,392	7,509	662,557
May	603,969	516,055	86,596	31,559	25,129	6,430	635,528
June	545,252	453,956	91,296	21,492	16,511	4,981	566,744
July	500,381	427,213	73,118	17,461	13,600	3,861	517,792
Aug.	499,629	444,711	54,918	14,214	11,037	3,177	513,843
Sept.	415,332	365,651	49,681	13,817	10,710	3,107	429,149
Oct.							
Nov.							
Dec.							

Exports of Crude Rubber from Principal Producing Countries

(Long Tons)

	BRITISH MALAYA[1]							DUTCH EAST INDIES[2]							
	Gross Exports	Imports	Gross Exports Minus Imports	Ceylon[3]	India & Burma[3]	Sarawak[4]	British North Borneo[3]	Siam[4]	Java & Madura	Sumatra E. Coast	Other D.E.I.	Indo-China[3]	Amazon Valley	All Other[5]	World Total[7]
1923	252,016	70,432	181,584	39,971	6,416	5,705	4,237	1,718	32,930	46,344	57,822	5,067	16,765	7,856	406,958
1924	259,706	108,524	151,182	39,997	7,697	6,699	4,621	2,962	42,446	54,497	80,347	6,688	23,165	9,065	429,366
1925	316,825	158,022	158,803	49,566	10,082	5,424	5,377	5,377	46,757	65,499	120,626	7,881	25,298	13,797	517,523
1926	391,328	151,248	240,085	58,962	9,874	9,155	6,079	4,027	52,186	71,413	121,231	8,203	24,298	16,017	621,530
1927	371,322	182,845	188,477	55,356	11,321	10,923	6,582	5,472	55,297	77,815	142,171	8,645	28,782	15,633	606,474
1928	409,430	149,787	259,643	57,267	10,790	10,087	6,698	4,813	58,848	82,511	121,770	9,548	21,129	10,690	653,794
1927:															
Sept.	29,835	12,095	17,740	4,911	479	645	566	498	3,635	5,957	9,853	497	2,072	1,213	48,066
Oct.	29,846	15,801	14,045	5,245	802	721	591	542	3,810	7,755	13,633	775	2,752	939	51,520
Nov.	28,277	19,860	8,417	4,464	1,277	1,241	591	600	4,127	6,587	14,395	683	2,369	1,627	46,378
Dec.	32,185	17,865	14,320	4,130	1,395	946	592	664	5,763	7,878	13,438	1,191	3,340	1,444	55,101
1928:															
Jan.	27,789	16,618	11,171	3,830	1,605	842	581	525	4,851	7,988	11,774	1,100	2,273	1,025	47,565
Feb.	28,848	12,911	15,937	4,947	1,081	667	581	536	4,052	6,757	8,630	787	1,612	1,276	46,860
Mar.	27,879	10,508	17,371	3,683	775	645	581	269	3,999	5,825	9,690	700	2,750	1,211	47,499
Apr.	20,139	9,335	10,804	3,233	789	630	494	258	3,993	5,040	5,499	736	1,014	1,323	33,810
May	26,483	10,350	16,133	3,091	654	842	494	241	4,943	5,355	10,347	717	2,602	1,135	45,994
June	22,994	16,168	6,826	3,107	963	926	494	451	5,419	5,863	13,655	725	1,399	960	40,788
July	30,481	13,383	17,098	5,129	1,048	905	593	366	5,602	7,566	11,594	698	1,264	873	52,731
Aug.	35,674	15,114	20,560	5,720	398	1,227	593	544	5,668	7,438	11,893	712	1,732	450	56,936
Sept.	29,769	11,239	18,530	4,675	457	938	594	447	4,956	6,536	9,863	969	1,614	494	50,073
Oct.	24,476	12,603	11,873	3,999	864	949	564	457	5,295	7,474	10,124	513	1,399	732	44,243
Nov.	68,135	10,436	57,699	8,005	1,048	772	564	425	4,950	7,902	7,805	943	1,790	623	92,526
Dec.	66,763	11,122	55,641	7,848	1,113	744	565	294	5,120	8,792	10,896	948	2,220	588	94,769
1929:															
Jan.	52,546	13,415	39,131	8,301	1,664	873	600	461	5,640	8,067	11,076	850	2,134	642	79,439
Feb.	47,926	12,103	35,823	7,064	1,117	955	600	495	6,572	7,511	10,384	807	2,104	520	73,952
Mar.	49,448	14,553	34,895	6,583	1,413	758	601	499	5,515	6,620	10,629	658	2,332	786	71,289
Apr.	49,816	11,414	38,402	5,097	727	747	548	306	5,997	6,645	11,321	673	1,950	569	72,982
May	43,960	15,593	28,367	5,723	800	966	548	453	6,264	6,961	13,437	650	1,922	733	66,824
June	40,398	14,544	26,054	5,563	1,122	1,061	547	422	5,582	6,693	11,270	608	1,398	548	60,868
July	46,454	15,071	31,383	5,457	974	1,247	500*	462	6,422	7,192	13,995	555	1,457	543	70,187*
Aug.	50,441	15,469	34,972	5,564	685	993	500*	431	4,644	7,298	10,782	545	1,563	499	68,476*
Sept.	53,484	12,392	41,092	7,961								755			

(1) Malayan net exports cannot be taken as production, since imported rubber is largely wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 115 tons in 1923, 1,117 in 1924, 3,618 in 1925, 3,263 in 1926, 2,439 in 1927 and 1,437 in 1928. (2) Ceylon Chamber of Commerce statistics until 1926; rubber exported as latex is not included— such shipments were equivalent to 18 tons in 1923, 93 tons 1924, 6 tons 1925, 20 tons in 1926, about ½ ton in 1927, and 1 ton in 1928. (3) Official statistics. (4) Imports into Singapore and Penang. (5) Exports from "Other D.E.I." are chiefly wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 2,342 tons in 1923, 1,008 tons 1924, 2,239 tons 1925, 44 tons in 1926, 84 tons in 1927, and 1,459 tons in 1928. (6) Calculated from official import statistics of principal consuming countries, viz., United States, United Kingdom, France, Germany, Belgium and Netherlands. This figure includes guayule rubber. (7) This total includes the third column for British Malaya, "Gross Exports minus Imports," and all the figures shown for the other territories. *Figure is provisional; final figure will be shown immediately it becomes available.

Net Imports of Crude Rubber into Principal Manufacturing Countries

(Long Tons)

	United States*	United Kingdom	France (h)	Germany	Canada (ac)	Japan (da)	Italy	Russia (ce)	Australia (ed)	Belgium (d)	Netherlands	Scandinavia (abcdf)	Spain (g)	Czechoslovakia (abcd)	World Total
1919	236,977	42,671	17,685	5,584	6,395	9,758	9,894	75	1,002	3,995	2,771	3,149	2,418	9	342,378
1920	248,762	56,844	13,885	11,890	11,746	5,297	6,128	62	1,815	3,840	5,510	2,292	2,008	567	370,641
1921	179,678	42,087	15,135	21,920	8,124	21,713	3,906	165	1,014	1,705	1,022	1,279	2,245	569	300,562
1922	296,267	11,724	24,352	27,546	9,207	15,934	6,480	2,493	2,643	172	-3,807	1,778	589	567	395,885
1923	300,372	12,700	27,392	18,519	13,277	15,872	8,489	2,986	1,649	2,184	792	2,528	630	1,128	408,018
1924	317,747	-11,550	30,446	22,727	14,299	19,571	8,764	2,346	3,124	2,688	-807	3,178	944	1,370	414,847
1925	381,815	4,061	32,956	33,937	19,683	11,117	11,412	7,088	4,757	2,930	875	3,149	1,155	1,558	516,493
1926	395,667	84,865	34,240	22,775	20,229	18,125	9,809	6,529	9,021	2,498	2,670	4,046	1,299	1,870	613,649
1927	398,483	60,249	34,271	38,892	26,405	20,521	11,381	12,018	9,490	6,482	636	4,224	2,055	2,672	627,789
1928	404,496	4,846	36,498	37,855	30,447	25,621	12,483	15,134	8,480	7,958	2,243	4,418	3,178	3,138	596,695
1927:															
August	31,001	3,463	2,795	3,119	2,013	1,970	1,274	386	650	604	-63	312	138	123	47,785
September	29,801	7,800	1,956	2,891	1,850	2,025	684	518	772	552	-33	451	155	272	49,694
October	27,671	5,888	3,479	4,202	1,790	1,966	1,021	1,075	908	465	156	401	153	363	49,538
November	36,123	1,687	3,661	4,209	1,916	1,575	1,167	1,312	836	749	298	474	246	317	54,570
December	28,082	309	4,696	3,108	2,302	2,710	1,462	1,453	1,242	784	-202	514	268	300	47,028
1928:															
Jan.	37,120	1,921	1,764	2,485	2,290	1,861	760	755	802	589	52	261	335	376	50,871
Feb.	30,926	3,143	2,526	2,984	2,553	1,248	437	783	616	599	98	307	296	297	46,813
Mar.	36,893	3,179	1,902	3,521	2,989	1,694	763	231	918	816	95	351	497	398	54,247
April	35,663	—2,280	2,204	2,719	1,933	2,324	1,114	1,820	832	575	280	339	304	159	48,001
May	28,660	—5,322	3,297	2,944	2,180	2,288	1,090	3,893	655	746	209	485	220	213	41,558
June	25,143	—3,031	3,597	2,968	2,186	2,102	984	4,111	348	743	133	346	251	182	40,063
July	28,170	—1,374	3,518	3,387	2,692	2,026	1,598	724	591	895	395	294	175	384	43,475
Aug.	28,827	48	3,527	2,744	2,447	1,868	875	632	707	519	316	359	58	94	43,021
Sept.	36,800	4,199	3,524	3,553	2,812	1,837	1,278	20	603	597	345	377	277	235	56,457
Oct.	41,667	—934	3,728	4,386	2,943	3,711	1,049	98	766	696	141	527	250	318	59,346
Nov.	33,846	—3,141	3,278	3,694	2,799	2,150	1,340	689	837	544	31	337	252	282	46,938
Dec.	40,781	8,438	3,633	2,470	2,618	3,002	1,145	1,378	755	639	148	435	263	200	65,905
1929:															
Jan.	53,922	11,951	5,645	4,711	3,759	3,776	1,481	956	1,061	749	218	638	179	525	89,571
Feb.	61,331	5,179	5,001	4,613	2,908	2,727	1,259	684	1,131	627	113	226	115	356	86,275
Mar.	46,391	9,068	4,409	4,586	4,961	2,630	1,515	716	725	931	316	354	80	409	77,091
Apr.	52,447	8,295	4,854	5,351	3,177	2,308	1,407	703	1,518	750	144	956	40	445	82,395
May	48,350	5,112	3,152	3,682	2,937	2,314	1,417	996	1,437	854	201	468	37	277	71,233
June	38,676	4,787	6,814	3,948	3,075	1,593	1,624	700*	2,215	672	687	507	24	420	65,742*
July	40,914	4,993	4,839	3,559	3,205	2,388	2,023		2,918	1,039	253	519		465	
Aug.	35,207	14,594		4,082	2,879		908		724		254				

a—Including gutta percha. b—Including balata. c—Re-exports not deducted in monthly statistics. d—Including some scrap and reclaimed rubber. e—Official statistics of rubber imports by Soviet Russia. f—Including Norway, Sweden, Denmark and Finland. g—United Kingdom and French exports to Spain except in years prior to 1925. h—French imports have been reduced 12 per cent in order to eliminate imports of gutta percha and to reduce to basis of net weight. *United States imports of guayule are not included in this compilation; such imports amounted to 4,305 tons in 1926; to 5,010 tons in 1927; to 3,076 in 1928; and to 743 tons in the first 8 months of 1929.

Domestic Production of Miscellaneous Rubber Goods

	Rubber Proofed Fabrics Yards	Rubber Heels Pairs	Rubber Soles Pairs	Mechanical Goods Shipments Dollars
1924	25,020,000	186,279,000	(1)	$48,615,000
1925	23,988,000	206,970,000	16,211,620(2)	64,877,000
1926	29,328,000	183,312,000	12,253,000	76,789,000
1927	37,872,000	201,014,000	27,160,000	68,625,000
1928	41,179,000	235,170,000	37,645,000	69,114,000
1928:				
January	2,177,000	17,682,000	3,431,000	$5,630,000
February	2,575,000	19,181,000	3,628,000	5,838,000
March	2,853,000	22,583,000	3,747,000	6,675,000
April	2,416,000	18,575,000	2,928,000	5,406,000
May	2,744,000	21,597,000	3,519,000	6,274,000
June	2,953,000	18,763,000	3,321,000	6,126,000
July	3,447,000	17,620,000	3,168,000	5,157,000
August	4,613,000	21,289,000	3,461,000	6,306,000
September	4,966,000	21,451,000	2,725,000	5,393,000
October	5,914,000	21,932,000	2,297,000	5,837,000
November	4,173,000	18,686,000	2,649,000	5,201,000
December	2,348,000	15,811,000	2,771,000	5,271,000
1929:				
January	2,828,000	19,975,000	3,876,000	6,033,000
February	3,095,000	18,979,000	2,869,000	6,135,000
March	3,952,000	17,226,000	2,746,000	7,013,000
April	4,000,000	17,256,000	2,601,000	7,035,000
May	4,860,000	19,541,000	2,916,000	7,189,000
June	4,409,000	20,007,000	2,502,000	6,792,000
July	4,260,000			6,306,000

(1) Not available; (2) Last 9 months only.
Source: "Survey of Current of Business of the Department of Commerce."

United States Imports of Guayule Rubber and Related Gums

(All quantities in Long Tons)

	Guayule Tons	Guayule Dollars	Balata Tons	Balata Dollars	Jelutong Tons	Jelutong Dollars	Gutta Percha Tons	Gutta Percha Dollars
1919	1,430	760,690	727	987,038	8,332	2,213,964	2,900	1,068,698
1920	758	845,985	1,064	1,260,043	5,672	2,068,501	3,183	1,520,309
1921	58	26,945	814	1,077,859	1,745	851,893	985	333,564
1922	127	57,040	812	978,765	2,335	403,812	818	281,012
1923	1,155	542,227	700	898,524	4,565	853,308	912	375,167
1924	1,856	536,392	464	568,456	6,165	1,237,100	1,408	463,610
1925	3,781	1,803,448	517	574,750	6,749	1,642,531	1,603	629,284
1926	4,305	2,562,096	354	327,213	7,263	3,127,757	1,445	661,156
1927	5,018	2,674,957	582	447,246	7,785	2,448,657	1,494	728,172
1928:	3,076	1,755,685	731	430,855	7,552	2,540,059	1,597	777,128
July	191	100,342	123	46,747	378	113,295	81	27,344
Aug.	—	——	399	165,460	451	126,962	147	60,738
Sept.	—	——	60	38,198	2,028	713,736	125	56,768
Oct.	—	——	121	59,358	429	129,065	239	94,570
Nov.	—	——	59	41,119	472	140,116	88	35,409
Dec.	—	——	83	58,311	522	156,154	145	59,911
1929:								
Jan.	—	——	46	30,374	484	152,260	138	62,950
Feb.	—	——	82	70,209	823	255,594	40	19,806
Mar.	—	——	90	75,444	428	122,026	1	1,140
Apr.	83	38,241	163	93,240	1,086	315,621	1	1,086
May	125	57,260	70	67,891	752	212,400	76	24,053
June	145	62,808	31	26,038	802	248,143	77	25,612
July	200	86,175	49	46,440	572	180,065	14	5,807
Aug	190	80,443	58	47,769	575	171,783	—	——

Reclaimed Rubber in the United States

(All Quantities in Long Tons—100% Basis)

Year	Production	Consumption Tons	Consumption % to Crude	Stocks*	Year	Production	Consumption Tons	Consumption % to Crude	Stocks*
1919	81,366	78,585	36.3	.....	1924	80,079	76,072	22.4	.....
1920	86,395	75,297	38.4	.....	1925	132,930	137,105	35.6	13,203
1921	36,725	41,351	24.1	.....	1926	180,582	164,500	45.9	23,218
1922	57,854	54,458	19.3	.....	1927	189,144	178,471	47.6	24,980
1923	74,766	69,534	22.7	.....	1928	208,516	223,000	50.4	24,785
1927:									
Jan.	16,526	12,374	39.3	25,908	July	15,488	13,842	47.4	26,599
Feb.	15,860	14,424	47.8	27,291	Aug.	15,109	15,836	47.3	25,157
Mar.	16,788	13,528	37.4	27,124	Sept.	14,392	14,790	54.3	23,429
Apr.	14,483	16,677	46.5	25,712	Oct.	16,127	17,292	64.5	22,176
May	16,159	15,754	46.1	26,419	Nov.	15,477	14,876	55.5	21,728
June	16,652	15,547	46.0	25,811	Dec.	16,083	13,431	52.7	24,980
1928:									
Jan.	14,862	20,140	58.5	21,941	July	17,278	19,070	51.0	17,305
Feb.	15,291	18,670	55.4	20,848	Aug.	19,049	17,890	41.7	15,881
Mar.	17,069	20,680	57.9	19,558	Sept.	18,693	17,795	44.6	17,991
Apr.	15,393	19,280	58.8	19,283	Oct.	17,182	18,420	45.1	17,026
May	18,945	20,215	54.1	18,137	Nov.	18,245	18,380	49.1	22,399
June	18,781	18,140	48.2	18,709	Dec.	17,728	14,320	45.9	24,785
1929:									
Jan.	18,685	21,068	49.1	24,394	July	18,387	20,236	48.7	19,679
Feb.	18,094	19,829	47.7	23,305	Aug.	19,787	18,230	47.6	22,309
Mar.	19,984	20,867	46.7	22,076	Sept.	18,660	17,071	49.2	24,984
Apr.	19,899	22,435	47.3	20,680	Oct.				
May	20,385	23,176	47.1	19,479	Nov.				
June	18,416	18,141	42.0	17,980	Dec.				

*Stocks on hand at the end of month or year. Exports of reclaimed rubber, not shown in this table, amounted to 8,540 tons in 1927 and 9,577 tons in 1928.

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